State of California
THE RESOURCES AGENCY
Department of Water Resources
Northern Branch

WATERMASTER SERVICE IN NORTHERN CALIFORNIA
1963 SEASON

OFFICE REPORT

MAY 1964

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THE RESOURCES AGENCY OF CALIFORNIA
DEPARTMENT OF WATER RESOURCES

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PART I - GENERAL INFORMATION

Introduction

The distribution of water in watermaster service areas is a continuing statutory function of the Department of Water Resources as provided in Part 4, Division 2 of the Water Code. The major purpose of the program is to provide for the equitable distribution of the waters of the State where the rights to these waters have been defined, either by court decree or by voluntary agreement, in a manner that will prevent expensive and unnecessary litigation.

The first watermaster service areas were created in September 1929 with the most recent addition being made in April 1959. Prior to 1929, watermaster service was provided in accordance with the Water Commission Act of 1914.

Table 1 presents the watermaster service areas with the corresponding decrees under which those areas are operated.

There are 16 watermaster service areas in Northern California. Fourteen of these service areas, located within the Northern Branch boundaries, were administered by eight watermasters, and the remaining two, located in the Delta Branch, were administered by two watermasters. Plate 1 shows the name and location of each of the service areas.

Watermasters are charged with the responsibility of assuring the equitable distribution of the water within their service area. To accomplish this, it is necessary for the watermaster to determine the water available for distribution and how this water will be distributed to best serve the needs of the water users and yet stay within the provisions and limitations of the court decrees or voluntary agreements

defining the water rights. For this purpose it is necessary to design and supervise the construction of diversion dams, headgates, and measuring devices to accomplish proper distribution of the water.

The service areas covered by this report are located primarily in the mountainous northeastern part of the State. The growing season is about 100 to 140 days with meadow hay and pasture being the principal crops. Most of the irrigation is accomplished by gravity systems, with each water user diverting directly from the streams at one or more diversion points. Each watermaster supervises about 200 or 300 diversions in one or more service areas and, due to the number of diversions involved, does not visit each point of diversion except when a specific need arises.

The need for visiting many of these points of diversion is increased substantially in years of short supply. In some of the areas it is necessary to predict the water supply in advance to determine the date service will start and, to some extent, the manpower needed. The department's water conditions reports are used to assist in estimating these requirements.

Water Supply

The water supply in the watermaster service areas is derived primarily from the unregulated runoff of small streams. This runoff occurs mostly from snowmelt in the spring with relatively small flow available in the summer and early fall. Supplemental supplies from stored water or ground water are used in some areas but are not regulated by the watermaster in most cases.

Precipitation

The water available for distribution from the various streams is affected by total precipitation, snowpack, temperature, and the amount of

TABLE 1

SUPERIOR COURT DECREES REGULATING WATER DISTRIBUTION
AND DATES WATERMASTER SERVICE AREAS CREATED

Watermaster service area	Name of stream system	County	Decree number	Date watermaster service area created	Remarks
Ash Creek	Ash Creek	Modoc* and Lassen	3670	4-03-59	Included as part of Big Valley service area 1949 through 1958.
Big Valley	Pit River	Modoc* and Lassen	6395	11-13-34	Service provided in accordance with recorded agreement in 1934. Service area operated under recorded agreement 1935 through 1958, and under decree since 1959.
Burney Creek	Burney Creek	Shasta	5111	9-11-29	Service provided in accordance with decree since 1926.
Butte Creek	Butte Creek	Butte	18917	1-07-43	
Cow Creek	North Cow Creek	Shasta	5804	10-17-32	
	Oak Run Creek	Shasta	5701	10-17-32	Included in Cow Creek service area 1-21-38.
	Clover Creek	Shasta	6904	1-21-38	
Hat Creek	Hat Creek	Shasta	5724 7858	9-11-29	Service provided in accordance with decree since 1924.
Indian Creek	Indian Creek	Plumas	4185	2-19-51	
Middle Fork Feather River	Middle Fork Feather River	Plumas* and Sierra	3095	3-29-40	
North Fork Cottonwood Creek	North Fork Cottonwood Creek	Shasta	5479	9-11-29	Service provided intermittently in accordance with the decree since 1924.

TABLE 1 (CONTINUED)

SUPERIOR COURT DECREES REGULATING WATER DISTRIBUTION
AND DATES WATERMASTER SERVICE AREAS CREATED

Watermaster service area	Name of stream system	County	Decree number	Date watermaster service area created	Remarks
North Fork Pit River	North Fork Pit River and all tributaries except Franklin Creek	Modoc	4074	12-18-39	These stream systems consolidated into North Fork Pit River service area 12-13-40.
	New Pine Creek	Modoc	2821	6-22-32	
	Cottonwood Creek	Modoc	2344	12-13-40	
	Davis Creek	Modoc	2783	7-13-32	
	Franklin Creek	Modoc	3118	12-14-33	
Seiad Creek	Seiad Creek	Siskiyou	13774	11-06-50	Service provided in accordance with decree by order of the court in 1950.
Shackleford Creek	Shackleford Creek	Siskiyou	13775	11-06-50	Service provided in accordance with decree by order of the court in 1950.
Shasta River	Shasta River	Siskiyou	7035	3-01-33	
South Fork Pit River	South Fork Pit River	Modoc* and Lassen	3273	12-31-34	
	Pine Creek	Modoc	Agreement	1-12-35	
Surprise Valley	Cedar Creek	Modoc	1206 2343	9-11-29	Service started in accordance with the decree in 1926.
	Soldier Creek	Modoc	2405	9-11-29	Service was provided on Soldier and Owl Creeks in accordance with the decrees by order of the court in 1929.
	Owl Creek	Modoc	2401	9-11-29	

TABLE 1 (CONTINUED)

SUPERIOR COURT DECREES REGULATING WATER DISTRIBUTION
AND DATES WATERMASTER SERVICE AREAS CREATED

Watermaster service area	Name of stream system	County	Decree number	Date watermaster service area created	Remarks
Surprise Valley(Cont'd)	Emerson Creek	Modoc	2840	4-02-30	All stream systems in Surprise Valley except Bidwell Creek were consolidated into the Surprise Valley service area on 1-10-39.
	Mill Creek	Modoc	3024	12-30-31	
	Deep Creek	Modoc	3101	12-29-34	
	Pine Creek	Modoc	3391	1-13-37	
	Rader Creek	Modoc	3626	6-12-37	
	Eagle Creek	Modoc	3284	1-10-39	
	Bidwell Creek	Modoc	6420	3-16-60	
Susan River	Susan River	Lassen	4573	11-10-41	
	Baxter Creek	Lassen	8174	2-16-56	
	Parker Creek	Lassen	8175	2-16-56	

* Decree entered by the superior court of this county.

precipitation which occurs during the irrigation season. The precipitation during the irrigation season is particularly important in the upper Pit River-Surprise Valley area where the average amount during April, May, and June is about 25 to 30 percent of the seasonal total. The spring storms, which are normally accompanied by cooler temperatures, affect not only the supply, but also the demand for water. The temperature in the spring affects the demand for water and the manner in which the snowmelt runoff occurs. A hot, dry spring depletes the water supply very early even in cases where there is a normal snowpack; while a cold, wet spring can extend the supply well into the irrigation season. Cold spring temperatures, however, retard the growth of the crops and are not particularly desirable.

Data collected at representative snow courses showing the snowpack as of April 1, 1963, are presented in Table 2. This information was obtained from the department's Bulletin No. 120-63

Table 3 presents data on the precipitation at selected stations throughout the areas. The seasonal totals indicate the total water supply and form a basis for comparison as to the average.

Streamflow

The watermaster determines the amount of water available for distribution from the various streams within his area primarily by the use of stream gaging stations and measuring devices in the ditches. The watermaster has four sources from which he obtains this information:

(1) U. S. Geological Survey Stream Flow Measurement Stations.

(2) Department of Water Resources Surface Water Measurement Stream Flow Measurement Stations.

(3) Stations which are maintained by the watermaster primarily for aid in distributing the waters.

TABLE 2

SNOWPACK AS OF APRIL 1, 1963, AT REPRESENTATIVE SNOW COURSES

Watermaster service area	Snow course *	Elevation, in feet	Water content of snow, in inches				
			April 1 Average (1930-1959)	April 1 1963	In percent of April 1 Average	May 1 1963 **	In percent of April 1 Average **
Shasta River	Mount Shasta	7,900	49.4	31.1	63	54.7	111
Shackleford Creek	Parks Creek	6,700	34.1	17.6	51		
Seiad Creek	Middle Boulder No. 1	6,600	32.9	8.7	26	21.3	65
	Little Shasta	6,200	21.4	2.5	12		
Surprise Valley	Blue Lake Ranch	7,300	11.3	0.9	8		
North Fork Pit River	Eagle Peak	7,200	16.2	3.3	20		
South Fork Pit River	Cedar Pass	7,100	17.0	3.9	22	9.1	54
Ash Creek	Adin Mountain	6,350	14.0	2.8	21	4.9	35
Big Valley							
Hat Creek	Thousand Lakes	6,500	38.0	2.9	8	20.1	52
Burney Creek	New Manzanita Lake	5,900	6.7	3.8	57	2.0	30
Cow Creek	Burney Springs	4,710	3.1	0	0		
North Fork Cottonwood Creek							
Butte Creek	Humbug Summit	4,840	12.4	4.3	35		
Susan River	Silver Lake Meadows	6,440	27.7	7.8	28	14.8	53
	Fredonyer Pass No. 1	5,750	9.7	1.2	12		
Middle Fork Feather River	Independence Lake	8,450	41.1	27.4	67	39.2	95
Indian Creek	Mount Deyer No. 1	7,080	24.2	8.3	34		
	Rowland Creek	6,700	18.1	5.5	30	10.4	57
	Yuba Pass	6,700	31.8	8.4	27	21.2	67

* Snow courses are listed according to elevation within each major grouping of watermaster service areas. They do not necessarily correspond to any specific river or creek.

** May 1 data included for selected courses due to unusually heavy late storms.

TABLE 3
PRECIPITATION AT SELECTED STATIONS
1962-63 SEASON

Station name	County	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Total	Percent of mean
Happy Camp Ranger Station	Siskiyou	11.48	8.55	7.93	2.69	8.55	8.67	9.36	3.31	1.02	0.00	T	0.15	61.71	122
		3.46	7.46	9.22	9.63	7.27	5.30	3.48	2.09	1.05	0.23	0.17	1.08	50.44	
Yreka	Siskiyou	6.00	2.71	3.32	1.06	4.35	1.42	2.02	0.53	0.50	0.13	0.50	0.15	22.69	131
		1.29	2.38	2.89	2.95	2.15	1.45	1.01	0.98	0.84	0.46	0.35	0.57	17.32	
Fort Jones Ranger Station	Siskiyou	5.78	4.03	3.65	1.83	3.55	1.68	3.18	1.56	0.15	0.11	0.08	0.07	25.67	123
		1.78	2.88	3.66	3.09	2.83	2.41	1.12	1.24	0.74	0.39	0.29	0.43	20.86	
Redding Fire Station #2	Shasta	8.85	3.14	5.04	4.15	3.27	5.64	8.11	1.58	0.17	0.00	0.01	0.00	39.96	107
		1.96	4.07	6.73	7.41	6.30	4.79	2.76	1.63	1.01	0.11	0.10	0.58	37.45	
Chico	Butte	9.86	1.57	3.64	3.93	2.90	5.27	5.77	1.08	0.09	0.00	0.00	0.03	34.14	135
		1.20	2.62	4.96	5.02	4.38	3.29	1.91	1.03	0.44	0.02	0.05	0.40	25.32	
Hat Creek Pump House #1	Shasta	7.98	1.11	2.25	1.59	2.23	4.35	3.26	3.14	0.61	0.00	0.02	0.17	26.71	148
		1.07	1.94	2.76	3.21	2.96	2.18	1.34	1.11	0.68	0.16	0.15	0.43	17.99	
Bieber	Lassen	8.77	2.19	1.85	1.95	2.71	1.74	4.42	1.73	1.17	0.00	0.20	0.33	27.06	161
		1.31	1.90	2.33	2.52	2.21	1.92	1.38	1.37	0.90	0.22	0.15	0.58	16.79	
Lakeview, Oregon	Lake	6.62	1.81	1.42	1.84	1.90	1.30	2.95	3.42	1.98	0.24	0.23	0.15	23.86	167
		1.14	1.43	1.99	1.73	1.61	1.49	1.17	1.45	1.38	0.18	0.16	0.52	14.25	
Cedarville	Modoc	6.86	1.01	1.06	0.83	1.94	0.73	2.96	1.12	1.51	T	0.37	0.30	18.69	154
		0.99	1.36	1.56	1.84	1.43	1.32	0.97	0.99	0.83	0.22	0.14	0.47	12.12	
Alturas	Modoc	6.17	1.21	0.88	0.60	1.69	1.20	2.72	1.42	0.97	0.07	0.55	0.56	18.04	148
		0.96	1.28	1.49	1.62	1.37	1.32	1.02	1.11	0.89	0.34	0.25	0.51	12.16	
Jess Valley	Modoc	6.17	1.86	0.93	0.63	1.71	1.09	4.02	3.20	2.17	T	0.53	1.02	23.33	141
		1.20	1.77	1.96	2.21	1.94	1.80	1.45	1.63	1.29	0.29	0.23	0.72	16.49	
Susanville Airport	Lassen	12.26	0.61	1.96	1.08	1.06	1.37	2.06	0.74	0.80	0.28	0.09	1.08	23.39	213
		0.60	1.24	1.81	2.12	1.67	1.33	0.69	0.57	0.40	0.13	0.08	0.32	10.96	
Vinton	Plumas	6.77	0.55	1.06	3.81	1.66	1.09	2.83	1.46	0.91	0.10	0.27	0.78	21.29	200
		0.52	1.02	1.88	1.99	1.31	1.14	0.89	0.64	0.83	0.06	0.10	0.25	10.63	
Sierraville Ranger Station	Sierra	15.39	2.10	2.25	4.14	6.69	3.85	5.81	2.23	1.61	0.00	0.07	1.13	45.27	187
		1.36	2.65	3.99	5.00	4.03	3.13	1.57	1.02	0.57	0.29	0.18	0.43	24.22	
Greenville Ranger Station	Plumas	16.55	3.83	3.94	4.39	4.20	6.64	8.57	1.52	1.10	0.00	0.04	1.47	52.25	146
		1.82	3.88	5.97	7.05	6.10	5.02	2.56	1.65	0.75	0.15	0.18	0.62	35.75	

* Figures above line are for current season; below line are long-term averages.

(4) Measuring devices installed in individual ditches by the water right owner.

Data on streamflow at various stations used by the watermasters are shown in Appendix A. These data show the distribution of runoff during the season which is an indication of water supply adequacy at any time and defines the periods during which shortages occurred.

The 1963 water year must be considered as the most unusual of many typically unusual seasons in the mountain valleys watermaster service areas.

Beginning with a wind and rain storm of record proportions in mid October 1962, as shown in Table 3, the stage was set for the first "wet" season since the pre-drought year of 1958. Depleted ground water supplies were recharged and most surface reservoirs were replenished. Although extensive wind and flood damage occurred, a general feeling of satisfaction pervaded in the service areas. By late winter, however, apprehension was the key word as normal winter storms had failed to materialize. Many areas were almost entirely devoid of any snowpack (see Table 2)and only a few of the representative snow courses could claim as much as 50 percent of their long-time average for April 1.

In seemingly miraculous fashion, light snow storms occurred almost daily throughout April and into May. Some areas recorded all-time records of precipitation for the month of April. As shown in Table 2, most of the snow courses made substantial gains during this period.

Due to the combination of these late storms and the excellent conditions of both surface and ground water storage areas existing after the October storms, the water supply for the early irrigation season was the best since 1958. However, stream flows in late summer dropped below normal in many areas reflecting the meager snowpacks of the spring.

Table 4 presents the runoff data at selected stations. These data compare the 1963 runoff at these stations with the average and give an indication of the adequacy of the over-all water supply.

TABLE 4

RUNOFF AT SELECTED STATIONS
(In acre-feet)
1962-63 SEASON

Station	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Total	Average*	Percent Average
Shasta River near Yreka	21,560	14,090	23,890	13,990	29,940	16,020	17,370	14,750	7,840	4,820	3,060	6,170	173,500	126,700	137
Hat Creek near Hat Creek	12,370	7,030	8,590	9,260	11,420	7,600	8,610	12,270	11,470	8,650	8,170	7,700	113,100	94,840	119
Pit River near Canby	65,690	9,890	17,500	6,880	45,180	12,160	67,850	64,840	12,540	4,160	2,620	5,020	314,330	162,200	194
North Fork Pit River near Alturas	10,050	1,980	3,050	1,690	7,130	2,610	22,780	23,390	2,180	292	57	136	75,340	-	-
South Fork Pit River near Likely	3,880	2,260	2,890	1,590	1,900	506	7,410	21,130	9,550	3,530	8,230	2,850	65,730	51,980	126
Susan River at Susanville	13,130	4,410	7,540	4,910	16,940	4,240	22,590	18,320	5,150	5,990	1,560	509	105,300	68,700	153
Indian Creek near Crescent Mills	90,610	16,200	36,530	19,200	158,200	36,460	159,000	99,000	24,860	5,630	1,570	2,590	649,800	382,300	170
Middle Fork Feather River near Clio	39,350	6,280	17,300	20,030	104,000	20,600	79,410	37,970	11,920	2,980	1,210	1,540	342,590	194,000	177
Butte Creek near Chico	47,660	13,290	34,110	34,770	53,320	35,400	84,600	42,850	18,550	11,720	9,670	8,770	394,710	280,900	141

* Average annual flow of record through 1961.

PART II - 1963 WATERMASTER SERVICE

Ash Creek Watermaster Service Area

General Description

The Ash Creek service area is located in Modoc and Lassen Counties in the vicinity of the town of Adin. There are 34 water right owners in the area with total water right allotments of 123.65 cubic feet per second. The major sources of water supply for the service area are Ash Creek and two tributaries, Willow Creek and Rush Creek. Each of these streams is considered independently, in so far as water supply and distribution are concerned. Ash Creek rises in the eastern part of the service area and flows through the town of Adin in a westerly direction into Ash Creek Swamp and then into the Pit River. Rush Creek rises in the northeast part of the service area and joins Ash Creek above the town of Adin. Willow Creek rises in the southeast part of the service area and joins Ash Creek near the head of Ash Creek Swamp. The major place of use of the water from this stream system is in Big Valley, west of the town of Adin, with some use along the upstream tributaries. The portion of Big Valley served by this stream is approximately 10 miles long by 6 miles wide and extends from the town of Adin to the stream's confluence with the Pit River. The valley floor is at an elevation of approximately 4,200 feet.

Water Supply

The water supply for Ash Creek and Rush Creek is derived primarily from snowmelt with most of the watershed lying between the elevations of 5,000 and 6,000 feet, while Willow Creek receives a substantial portion of its water from springs. These three creeks normally have sufficient water to supply demands until about June 1, after which the supply decreases rapidly.

By the latter part of June, Ash Creek normally has receded to about 20 cubic feet per second; Rush Creek to about 2 cubic feet per second; and Willow Creek to about 5 cubic feet per second at the stream flow measurement stations. The flow of these creeks then remains nearly constant for the remainder of the season. The mean daily discharge for Ash Creek is presented in Table A-1; Rush Creek in Table A-2; and Willow Creek in Table A-3. The stream flow measurement stations on Ash Creek and Rush Creek are below a substantial number of the points of diversion and, consequently, the records do not show all of the available supply of these creeks.

Method of Distribution

Irrigation on Ash Creek and its tributaries is accomplished by small dams with most of the users having several ditches diverting from the stream. These ditches serve to convey the water to the fields where it is spread by means of small lateral ditches. Some of the users employ a system of checks and borders; however, most of the land is irrigated by wild flooding, the return flow being captured by downstream users for their re-use. In a few cases, pumps are used to divert the water into ditches or through sprinkler systems.

1963 Distribution

Ash Creek. Watermaster service began early in April and continued through the end of September in the Ash Creek service area. Due to rains in April and May, the water supply was much better than had been anticipated prior to the opening of the watermaster season. The water supply for Ash Creek was better than average with sufficient water for all priorities until about July 1. During the remainder of the season there was generally sufficent water to satisfy first priority allotments.

Willow Creek. There was generally sufficient water for all priorities until the middle of June. Thereafter, the supply diminished until, by the end of August and continuing throughout the season, there was water available for only 60 percent of the second priority allotments.

Rush Creek. Rush Creek had sufficient water to supply all demands until the early part of July. By the 1st of August, the supply had diminished until 50 percent of the allotments were available.

The use of irrigation water on Rush Creek was somewhat hampered and diminished by the rerouting of the channel due to road construction during the summer.

Big Valley Watermaster Service Area

General Description

The Big Valley service area is located in Modoc and Lassen Counties in the vicinity of the towns of Lookout and Bieber. There are 51 water right owners in the area with total allotments of 231.03 cubic feet per second. The major source of supply for the service area is the Pit River, which enters the valley north of the town of Lookout, flows through the western part of the valley in a southerly direction through the town of Bieber and out the southern end of the valley. The major place of use is the valley floor of Big Valley for about 13 miles along the Pit River at an approximate elevation of 4,200 feet.

Water Supply

The Pit River provides the major source of water supply for the Big Valley service area. Extensive upstream use, most noticeably in Hot Springs Valley approximately 20 miles upstream, greatly influences this supply. In a normal year a substantial flow is available until about June 1, at which time the irrigation in Hot Springs Valley results in a very significant decrease in the amount of water available. The irrigation practices of Hot Springs Valley result in stopping most of the flow for some time and then releasing relatively large heads of water from the lower diversion dams about every 15 or 20 days. The natural flow available for use in Big Valley is usually about 15 to 20 cubic feet per second for about two weeks, and then the flow may reach a peak of from 200 to 300 cubic feet per second for short periods. Roberts Reservoir, located at the upper end of the valley above the town of Lookout, serves as a supplemental source of water to those users of the area who are members of the Big Valley Mutual

Water Company. This supply is released into Pit River and distributed to these members along with their natural flow rights. Table A-4 shows the daily mean discharge of Pit River at Canby. Table A-6 shows the releases from Roberts Reservoir. Plate 2 shows the hydrographs of Pit River near Canby and Roberts Reservoir releases.

Method of Distribution

Most of the users in the Big Valley service area irrigate on a rotation schedule by use of large flashboard dams which are placed in the channel. Some of the users employ checks and borders with a few utilizing pumps for diversion either through sprinkler systems or ditches; however, most of the land is irrigated by wild flooding. By so doing, it is possible to use the large heads of water characteristic of the water supply with the return flow being recaptured for use by subsequent users which results in a higher efficiency for the area as a whole. The flow during the season usually fluctuates from 15 cubic feet per second to as high as 300 cubic feet per second. During the periods when the flow is inadequate for purposes of wild flooding, the users employing pumps usually irrigate their lands and then allow the intermittent larger heads of water to pass undisturbed for use by those limited to irrigating by wild flooding.

1963 Distribution

Big Valley. Due to an unusually light snow pack in the mountains and an anticipated light runoff, watermaster service commenced early in April and continued through September.

Continuing rainstorms during the months of April and May resulted in abnormally high flows providing sufficient water for all priorities until approximately July 15. For the remainder of the season there was a sufficient

water supply to satisfy approximately 50 percent of the second priority needs. After haying on about July 23, water was released from Roberts Reservoir for use by the shareholders of the Big Valley Mutual Water Company as shown in the following tabulation:

NAME	SHARES	WATER USED IN ACRE FEET
Norris & Peter Gerig	5	85
Oral (Sam) Gerig	3	75
Lester Babcock	3	240
L. W. Kramer	2	100
Hunt Estate Co.	2	50
Arad Babcock	1	85
Merlin Kennedy	1	65
Cyril Mamath	1	25
Ford Ranch	1	100
L. H. Monchamp	1	---
Total	20	825

Three partial irrigations totaling approximately 0.5 acre-feet per acre were available from July 15 until September 15. From September 15 until the end of September sufficient water was available for a complete irrigation of all second priority users.

Reconstruction of the Lookout diversion dam during the 1963 season caused considerable difficulty in the distribution of water. A loose earth-fill coffer dam was placed in the river above the Lookout dam site from July 30 until September 4. This coffer dam diverted the entire flow of the Pit River combined with Roberts Reservoir releases through the Three Corners

Slough Diversion. This water, with the exception of that used by the Three Corners Slough irrigators, was routed through Three Corners Slough to Ash Creek and then into the Pit River via Ash Creek pipe above Gerig Dam. Flows through this route of greater than 35 to 40 cubic feet per second resulted in excessive spreading and greater than average losses due to seepage and evaporation. Flows up to 90 cubic feet per second were diverted for short periods when peak flows existed in the river but such flows caused considerable concern as to the safety of the cofferdam. These quantity limitations hampered the share holders in Big Valley Mutual Water Company in that water could not be released from Roberts Reservoir when the Pit River flow was equal to or greater than the maximum safe discharge of the Three Corners Slough Diversion even though there was a need for this stored water. All ranches that irrigate by wild flooding were affected in that they can irrigate more efficiently with a large flow for a short period than with a smaller flow for a longer period.

Another problem was created by the fact that the banks of Ash Creek are considerably lower than the banks of the Pit River above the Gerig Dam. Water therefore could not be raised as high in the Pit River as it is normally held during irrigation periods or the water would have backed up and overflowed the banks of Ash Creek rather than flow through Ash Creek pipe into Pit River. These lower water levels above the Gerig Dam resulted in reduced coverage for all irrigators using this dam for diversion purposes. Because of this condition the Kramer Ranch could not obtain any water during this period of time.

Burney Creek Watermaster Service Area

General Description

The Burney Creek service area is located in Shasta County near the town of Burney. There are 10 water right owners in the area with total allotments of 33.09 cubic feet per second. The source of supply for this service area is Burney Creek, which enters the southern part of the service area and flows through the town of Burney in a northerly direction to the Pit River. The portion of the valley served by this stream is approximately 11 miles long by 2 miles in width and extends north and south of the town of Burney. The valley floor is at an elevation of approximately 3,200 feet.

Water Supply

The water supply for Burney Creek is derived from springs and snowmelt, with most of the watershed lying between the elevations of 4,000 and 7,500 feet on the northeast slopes of Clover Mountain and the west slopes of Burney Mountain. The creek normally has sufficient water to supply all demands until about the middle of June; the supply then gradually decreases until the end of July. During the remainder of the irrigation season the flow remains nearly constant at approximately 40 percent of allotments, being stabilized by the runoff of perennial springs. The mean daily discharge for Burney Creek is presented in Table A-7. The stream flow measurement station on Burney Creek is below four points of diversion, consequently, the records do not show all of the available water supply of the creek.

Method of Distribution

The court decree on Burney Creek sets forth a rotation schedule of distribution. The water users, however, in past years have found it more beneficial to irrigate on a continuous-flow basis, which is now the normal practice. The water allotted to the Greer-Cornaz Ditch is distributed to

the various users on that ditch by the watermaster in accordance with a supplemental court decree.

The water is diverted from Burney Creek, in most cases by means of low diversion dams, into ditches which convey the water some distance to the place of use. Lateral ditches are then used to irrigate the land. Scott Lumber Company diverts their allotment for industrial use by means of a pump and pipeline.

1963 Distribution

The waters of Burney Creek were again distributed on a continuous flow basis. Water supply available for distribution, determined by addition of all diversions from the creek, was sufficient to fill 100 percent of allotments through the second week of July. The flow then gradually decreased to approximately 50 percent of first priority allotments during the last week in August, thereafter remaining fairly constant through the month of September.

Three screw-type, steel headgates and a concrete Parshall flume were constructed and installed early in the season in the Greer-Cornaz ditch to regulate the flow to two of the lower users. With the completion of these structures allotments to all users in the Greer-Cornaz ditch can be measured and distributed according to the Burney Creek decree.

A concrete Parshall flume was also installed later in the year in the Haynes Ranch upper ditch near the point of diversion. It replaced a wooden rectangular weir which had been located at a considerable distance further down the ditch. This new measuring device is expected to increase the accuracy of the measurement of allotments to the Haynes Ranch.

Butte Creek Watermaster Service Area

General Description

The Butte Creek service area is located in Butte County near the city of Chico. There are 30 water right owners in the area with allotments of 219.71 cubic feet per second. Butte Creek is the source of supply for this service area. The area served by this stream is approximately 20,000 acres, at an elevation of about 150 feet, on the Sacramento Valley floor extending from a point east of Chico about 11 miles south to the diversion of the Great Western Canal.

Water Supply

Butte Creek rises on the west slope of the Sierra Nevada Mountains in the northeasterly portion of Butte County between Humbug and Humboldt Passes at elevations from 5,000 to 6,000 feet.

Snowmelt normally produces a fairly well substantiated flow until the end of June, after which the perennial springs at the headwaters produce a minimum summer flow of more than 40 cubic feet per second. Foreign water is transported from the West Branch of Feather River by means of the Hendricks (Toad Town) Canal through the DeSabla Reservoir and Powerhouse into Butte Creek. This foreign water is rediverted at Parrott Dam through the Parrott Ditch. The daily mean discharge of Butte Creek near Chico and near Durham is presented in Tables A-8 and A-9. The flow data presented in Table A-8 includes the foreign water from Hendricks Canal (presented in Table A-13).

Method of Distribution

Water is diverted from Butte Creek by pumps and by dams which divert the water into several ditches leading to the individual distribution systems. Various methods of irrigation are in general practice such as contour checks, strip or border checks, basin checks, furrows, wild flooding,

and sprinklers. The use of sprinklers has increased in popularity within the past few years, especially in the application of water to orchards.

Foreign water diverted by the Pacific Gas and Electric Company from the West Branch Feather River through the Hendricks Canal and DeSabla Powerhouse into Butte Creek has, in the past, caused wide fluctuation in the Butte Creek flow. In accordance with "Memorandum and Order", entered May 10, 1949, by the Superior Court of Butte County, water users below Parrott Dam must be provided their natural flow allotments at all times without undue fluctuation caused by intermittent presence of foreign water. This makes it necessary to check the rediversion of this foreign water carefully.

1963 Distribution

During the 1962 irrigation season, P.G.& E. revised their method of operating the DeSabla Powerhouse by maintaining a constant discharge. This practice was continued throughout the 1963 season. From May through June the releases varied only from 100 to 110 cubic feet per second. In July the releases were cut to and held at 70 cubic feet per second until the first week of September. In September, and for the remainder of the irrigation season, the releases averaged 66 cubic feet per second. This method of operation by the P.G.& E. has made the rediversion of the water imported from the West Branch Feather River (without undue fluctuation of natural flow allotments to water users below the Parrott Dam) less critical than in the past. There was sufficient flow in Butte Creek to supply all allotments until August 16. On this date it was necessary to shut off the Hansen pump as surplus water was no longer available. During the remainder of the irrigation season, careful regulation of all diversions made it possible to supply all first, second and third priority allotments.

Water stage recorders were maintained on Durham Colony Ditch, Dayton Ditch at Edgar Slough, and Parrott Ditch to aid in the distribution of Butte Creek water. These records are presented in Tables A-10, A-11, and A-12, respectively.

Cow Creek Watermaster Service Area

General Description

The Cow Creek service area is located in Shasta County in the foothills east of Redding. There are 78 water right owners in the area with total water right allotments of 56.355 cubic feet per second. The major sources of supply are North Cow Creek (commonly called Little Cow Creek), Cedar Creek (which is tributary to North Cow), Oak Run Creek, and Clover Creek. These creeks are tributaries of Cow Creek and all flow in a west or southwesterly direction through narrow valleys to Cow Creek near the town of Palo Cedro. The place of use is in the narrow valleys along the creeks and consists of small parcels separated by brush covered hills. The entire area is about 25 miles long by 10 miles wide and varies in elevation from about 500 to 2,000 feet.

Water Supply

The water supply for this service area is derived mostly from springs and seepage with some early snowmelt runoff. The watershed consists primarily of low brushy hills which do not accumulate a heavy snowpack. Relatively large amounts of precipitation during the winter normally produce substantial spring flow and seepage throughout the irrigation season.

The flow of Cedar Creek is usually sufficient to supply all allotments until about July 15, after which time the flow steadily decreases throughout the remainder of the season to about 15 percent of allotments.

The flow of North Cow Creek is, in many years, sufficient to supply all allotments. In drier years it is necessary to reduce the allotments in the latter part of the summer.

The flow of Oak Run Creek is augmented by a first priority right

of 5 cubic feet per second of foreign water diverted out of the North Cow Creek watershed. The flow of Oak Run Creek is normally enough to supply all allotments throughout the season.

The flow of Clover Creek is, in most years, sufficient to supply all priority rights throughout the season.

Records of the daily mean discharge of North Cow Creek and Oak Run Creek are presented in Tables A-16 and A-17.

Methods of Distribution

Water in the Cow Creek watermaster service area is for domestic and stockwatering purposes and for the irrigation of meadow hay, alfalfa, small orchards, and vegetable gardens.

The irrigation season normally begins in April or May and ends with the fall rains in September or October. The alfalfa and hay lands are irrigated by the wild flooding method with some sprinkler systems, the furrow method is used for the irrigation of gardens, and the basin or check method for orchards.

Much of the water applied lost by percolation returns to the creeks as seepage water and thereby augments the flow for the points of diversion further down stream.

1963 Distribution

Cedar Creek. The flow in Cedar Creek was sufficient to supply all allotments throughout the entire irrigation season. Through the late summer months Cedar Creek continued to supplement the flow to North Cow Creek users.

North Cow Creek. Surplus flow in North Cow Creek was available to all water users until August 17. On this date it was necessary to

regulate all diversions to 100 percent of allotments. Relatively mild summer temperatures in the Cow Creek basin kept evaporation and transpiration losses at a minimum, which provided the lower users with a water supply well above average.

Oak Run Creek. The water supply was sufficient to supply all first priority rights and a surplus right for the entire irrigation season. The point of diversion of this surplus water right is downstream from all the first priority points of diversion on Oak Run Creek. Very little regulation of upper diversions was necessary to assure continuous delivery of this surplus water allotment.

Clover Creek. There was sufficient water to satisfy all allotments throughout the season. Surplus water was available to all users even through the late summer months. The only regulation required was that of the laterals of the Mill ditch.

Hat Creek Watermaster Service Area

General Description

The Hat Creek service area is located in the eastern part of Shasta County north of Lassen Volcanic National Park. There are 41 water right owners in the area with total allotments of 134.60 cubic feet per second. Hat Creek, which flows in a northerly direction through the area, is the only source of supply in the Hat Creek service area. The place of use is Hat Creek Valley, which is approximately 20 miles long and 2 miles wide from a point about 3 miles south of the town of Old Station north to the confluence of Rising River and Hat Creek. The irrigable lands, which are made up of volcanic ash, are interlaced with large outcroppings of volcanic rock.

Water Supply

The water supply of Hat Creek is derived from snowmelt from Mount Lassen and from large springs. The snowmelt normally maintains a high flow during May and June, but the major portion of the supply is from the large springs which decrease only a small percentage throughout the season. The flow reflects not only the precipitation of the preceding winter but also the precipitation for several previous years. Only after a series of dry years does the flow of these springs fall below approximately 75 percent of allotments.

Method of Distribution

The Hat Creek decree divides the water rights on Hat Creek into two groups (upper users and lower users) who rotate in the use of water on a ten-day rotation schedule. This requires a complete reregulation of all diversions every ten days providing an irrigation supply to one group and a

minimum flow to the other group.

Most irrigating in the area is done by flooding with large heads of water to cover the land rapidly and prevent excessive loss from percolation in the extremely porous soil. Diversion dams constructed across the creek divert the water into large diversion ditches. The fields, many of which have checks and borders, are then flooded from the main diversion ditch or from laterals. A few domestic rights are taken by pumping from Hat Creek channel.

1963 Distribution

The distribution of Hat Creek water was continued on a ten-day schedule between upper and lower users beginning May 1. Late spring rains, combined with Lassen Peak's deep snow pack, assured Hat Creek water users of a very favorable irrigation season. Record-breaking hay crops stressed the importance of an abundant water supply to the water users of this area. From May to July, Hat Creek users diverted 100 percent of their allotments. On July 20, the upper users were regulated to 90 percent and on July 29 the lower users were regulated to 85 percent of their allotments. The creek then maintained this flow throughout the season and no further reduction in percent of allotment was necessary. Because of the large water rights involved, Hat Creek water users are usually unconcerned with a 10 to 15 percent reduction in their decreed allotments. Therefore, minimum flows were delivered to the lower users during their off-irrigation period with few of the problems normally encountered in years of short supply. Certain problems were encountered due to the congested condition of the channel in several places caused by willow and alder growth. This caused excessive channel loss and flooding in some areas.

Indian Creek Watermaster Service Area

General Description

The Indian Creek service area is located in the north central part of Plumas County in the vicinity of the town of Greenville. There are 44 water right owners in the service area with total allotments of 97.015 cubic feet per second. The major sources of supply in the service area are Indian Creek and two major tributaries, Wolf Creek and Lights Creek. Indian Creek and its minor tributaries rises in the mountains east of the service area and flows through Gennessee Valley and through Indian Valley past the towns of Taylorsville and Crescent Mills to its confluence with the North Fork Feather River. It is joined from the north by Lights Creek and Wolf Creek through the town of Greenville in the northwest part of the valley. The major place of use is in Indian Valley, which is about 4 miles long and $2\frac{1}{2}$ miles wide at an elevation of about 3,500 feet.

Water Supply

The water supply in the Indian Creek service area is derived primarily from snowmelt runoff with springs and seepage maintaining some late summer flows. The flow of Wolf Creek is normally sufficient to supply all allotments until the first of June while Indian and Lights Creeks, with the exception of some tributaries, have sufficient flow to supply all allotments until the first of July. After these dates, the flow steadily decreses throughout the season until by the end of August only a small proportion of allotments are available.

Records of the flow of Indian Creek are presented in Table A-19.

Method of Distribution

The basic method of irrigation in Indian Valley is wild flooding. Small bulkheads and diversion dams are placed in the stream channels to divert the water into distribution ditches for conveyance to the fields. Small check dams located throughout the fields in swales help to spread the water over the ground. There has been a limited amount of land leveling and border check construction in the valley. Also, sprinklers are used to irrigate a few fields.

1963 Distribution

Watermaster service commenced in the Indian Creek service area the first of May and continued until the end of September. The water supply was above average during the 1963 season due to the extreme storms of October and February and rains early in the irrigation season.

Wolf Creek. The water supply of Wolf Creek was sufficient to meet all demands until late in the season. This condition was due to the excellent water supply available at the beginning of the season and the shutting off of the Dee Dodge and Herman Posch pumps intermittently during the season. This condition assured lower users of their full allotments.

Lights Creek and Tributaries. Excellent water conditions generally prevailed throughout the Lights Creek area.

Cooks Creek produced flow at diversion number 80 until the middle of August, an unusual occurrence.

Lights Creek provided a sufficient water supply to meet all demands throughout the irrigation season.

Several diversion bulkheads were damaged during the winter storm and were not usable during the season. Construction of a new concrete structure at Diversion number 91 was accomplished during the latter part of the season.

Indian Creek. The water supply of Indian Creek was sufficient to meet all demands during the irrigation season. The Mill Race Ditch temporary diversion dam provided water for this diversion during the construction of a permanent structure in September. Rising water below this diversion dam provided enough flow for the down stream users.

With the abundant water supply during the 1963 season no special problems occurred in the operation of the Indian Creek Watermaster Service Area.

Middle Fork Feather River Watermaster Service Area

General Description

The Middle Fork Feather River service area is in the plateau area on the west slope of the main divide of the Sierra Nevada Mountains in the east portion of Sierra and Plumas Counties. There are 89 water right owners with total allotments of 370.755 cubic feet per second. The major sources of supply for this service area are the tributaries of the Middle Fork Feather River in Sierra Valley and are divided into five major stream groups. These groups, starting in the north and east corner of the valley and working in a south and westerly direction, are Little Last Chance Creek, Smithneck Creek, Webber Creek and tributaries, West Side Canal, and Fletcher Creek. The Middle Fork Feather River channel follows a general northerly direction for approximately 20 miles through Sierra Valley and then turns and flows in a westerly direction. The major place of use is in Sierra Valley, which is about 15 miles long and 10 miles wide. The average elevation of the valley floor is 4,900 feet.

Water Supply

The water supply in the Middle Fork Feather River service area is derived from snowmelt runoff, the minor flow from springs, and from supplemental stored and foreign water. The flow of Little Last Chance Creek is reregulated and supplemented by stored water by the use of Frenchman Dam which was constructed on the stream by the Department of Water Resources in 1961. This water is now released and used as needed.

The flow of Smithneck Creek is normally sufficient to supply allotments until about the middle of May and then decreases rapidly until the first of June when only first and second priority allotments are available

for the remainder of the season. The natural flow of Webber Creek is normally sufficient to supply allotments until the middle of May at which time foreign water up to 60 cubic feet per second is diverted from the Little Truckee River through the Little Truckee Ditch into Cold Stream and then Webber Creek for shareholders in the Sierra Valley Mutual Water Company. This supplemental supply drops rapidly during July with only small amounts of water available for the latter part of the season.

The West Side Canal Group streams normally supply all allotments until the first part of June with the flow of Fletcher Creek and Spring Channels normally supplying all allotments until the first of July. The flow of these creeks then gradually declines for the remainder of the season.

Records of the daily mean discharge of Last Chance Creek, Little Truckee Ditch, Middle Fork Feather River near Portola, Smithneck Creek, and Miller Creek, are presented in Tables A-20, A-21, A-22, A-23, and A-24.

Method of Distribution

Wild flooding is the method employed by the majority of the diverters to irrigate their lands. Small diversion dams are placed in the stream channels to divert the water into the individual distribution systems. Once the water reaches the fields, check dams are constructed in the swales to implement flooding.

1963 Distribution

Watermaster service started in the Middle Fork Feather River service area the first of April and continued through September 1963.

Little Last Chance Creek. Frenchman Dam and Reservoir went into its second season of operation this year. Agreements concerning storage and distribution were negotiated with the users in this stream group. The

resulting changes in procedures and specific details of distribution and project operation are covered in a separate report prepared by the Operations Section of the Delta Branch.

Smithneck Creek. The supply was sufficient to meet all demands until May 20, after which the demand increased and the supply decreased. By June 15, water was available for only first and second priority allotments, and by July 1, the entire supply was used to satisfy allotments in first priority.

Webber Creek and Tributaries. The natural flow of Webber Creek was sufficient to supply all demands until June 1, and with the diversion of foreign water from the Little Truckee River commencing about June 10, the total supply was sufficient to supply the demands of users having shares in the Sierra Valley Mutual Water Company until July 14. The natural flow supply decreased gradually after June 1, and by July 20, the supply was sufficient for only first and second priority allotments. From August 1, until the end of the season, an average of 30 percent of second priority allotments was available.

Little Truckee Ditch. The Sierra Valley Mutual Water Company imported 3,011 acre-feet of water through the Little Truckee Ditch during the period June 10 through September 30. Water was distributed to shareholders in accordance with Schedule 9 of the Middle Fork Feather River decree.

West Side Canal Group. The West Side Canal Group as defined in Schedule 7 of the decree consists of Hamlin, Miller, and Turner Creeks. The water supply in these streams was sufficient to supply all demands until about July 1, after which regulation was required on all three streams and on the West Side Canal. By August 1, 50 percent of second priority allotments were being served and from that date until the end of the season the

supply remained fairly stable. Stockwater was maintained throughout the entire system during the season.

Fletcher Creek and Spring Channels. Water from these sources was distributed on a continuous flow basis and was adequate to supply all demands until about July 1. The water supply decreased gradually thereafter and by August 1, 20 percent of second priority allotments were being served.

Special Occurrences. The January rains and resulting high water caused extensive damage to individual diversion structures throughout Sierra Valley with the exception of those structures on Little Last Chance Creek which were protected by upstream storage in Frenchman Reservoir. Along several streams at the south end of Sierra Valley, areas of meadow land were covered with gravel and sand as the flood water receded resulting in a significant loss of production.

The Sierra County Waterworks District No. 1 completed the installation of their new diversion dam on Fletcher Creek and transmission and distribution system in the town of Calpine during the fall of 1963. The system includes new fire hydrants and connections to over 100 lots in the community.

North Fork Cottonwood Creek Watermaster Service Area

General Description

The North Fork Cottonwood Creek service area is located in the southwestern part of Shasta County near the towns of Ono and Gas Point. There are nine water right owners in the area with total allotments of 30.30 cubic feet per second.

North Fork Cottonwood Creek, which is the major source of supply in the area, has its beginning on the east slopes of the foothills of the Coast Range Mountains. It flows in a southeasterly direction to its confluence with Cottonwood Creek near the town of Gas Point. The area is characterized by high summer temperatures and moderate rainfall. The irrigable land consists of sparsely scattered acreages separated by steep brushy hills and lies at the 1,000-foot elevation.

Water Supply

Snowmelt from the east slope of the Coast Range foothills is available in the North Fork Cottonwood Creek only during the early weeks of the irrigation season and is usually melted before irrigation demands are at a maximum. Perennial springs provide a gradually decreasing flow throughout the season. The flow is normally sufficient to supply all demands. The flow of North Fork Cottonwood Creek near Igo is presented in Table A-25. This stream flow station is downstream from the points of diversion on the creek but gives a general indication of the water supply.

Method of Distribution

The general practice throughout the area, with one exception, is to flood irrigate. The exception is a water user who pumps directly from

the creek and uses a sprinkler system to irrigate his crop. Pumping was necessitated at this diversion point because of the greater elevation of the irrigated land in relation to the creek channel.

1963 Distribution

During the 1963 irrigation season surplus water was available to all users on North Fork Cottonwood Creek through the month of July. Although, in August the flow began to gradually decrease, a sufficient water supply was available to satisfy all allotments throughout the season.

North Fork Pit River Watermaster Service Area

General Description

The North Fork Pit River service area lies along the western slopes of the Warner Mountain Range in the northerly portion of Modoc County. There are 98 water right owners in the area with total water right allotments of 215.065 cubic feet per second. The source of supply for the area consists of a number of small streams rising on the west slope of the Warner Mountains. Three of these streams are tributary to Goose Lake; namely (from north to south), New Pine Creek, Cottonwood Creek, and Davis Creek. Each flows in a general westerly direction from the slopes of the Warner Mountains to the eastern shore of Goose Lake. Five of these streams, tributary to North Fork Pit River are as follows: Linville Creek, Franklin Creek, Joseph Creek, Thomas Creek and Parker Creek. Shields Creek and Gleason Creek are tributaries to Parker Creek. All of the tributaries have their sources on the west slope of the Warner Mountains and flow in a general westerly direction to their confluence with the North Fork Pit River. The North Fork Pit River flows in a general southerly course from the south rim of Goose Lake to its confluence with the South Fork Pit River immediately below the town of Alturas.

The place of use in the North Fork Pit River service area extends from south of the town of Alturas to the Oregon border. It is about 45 miles long and 10 miles wide. The streams tributary to Goose Lake are not considered as part of the North Fork Pit River watershed as this lake has not spilled into the river for nearly 100 years. The water supply in this part of the area is used along these streams between the mountains and the lake.

The use of water on the North Fork Pit River and its tributaries is primarily in the narrow valleys near the streams. Each stream is dealt with separately for the purposes of distribution.

Water Supply

The streams which serve the area are fed by snowmelt runoff and springs on the Warner Mountains. A large portion of the runoff occurs early in the spring decreasing rapidly in May and June. The watershed of New Pine Creek, however, is at a higher elevation and maintains a good supply well into the summer. After the snowpack is depleted, perennial springs at the headwaters of the tributaries are the main source of water supply. Linville Creek has a small drainage basin and its flow depends almost entirely on the springs at its head.

Gleason Creek, Thoms Creek, and Cottonwood Creek normally dry up in August, except during years of better than average water supply.

Some supplemental water is stored in small reservoirs throughout the area none of which are operated by the watermaster. However, the inflows to some of these reservoirs are under the jurisdiction of the watermaster.

Methods of Distribution

Irrigation is primarily by small scale surface flooding from random field ditches along high spots in the meadows. The water is diverted from the natural stream by various type structures into small earth ditches which convey the water to the meadows. At present there is a limited amount of sprinkler irrigation, some by naturally developed pressure and some by direct pumping from small sumps in the ditches. Subirrigation by the use of large flashboard dams to raise the water level in the stream channel is being practiced on the North Fork Pit River between Parker Creek and the town of Alturas.

Stream gaging stations equipped with water stage recorders were maintained at a number of points in the North Fork Pit River service area

during the 1963 season as shown in the following tabulation:

Recorder station	:
New Pine Creek below Schroder's	Rated section
Cottonwood Creek below Larkin Garden Ditch	Rated section
Davis Creek at Old Fish Wheel	Rated section
Linville Creek at Powerhouse	3-foot weir
Franklin Creek above diversions	4-foot weir
Joseph Creek below Couch Creek	Rated section
Thoms Creek at Cedarville-Alturas Highway	Rated section
Parker Creek at Fogarty Ranch	Rated section
Parker Creek above Highway 395 near Alturas	Rated section
Shields Creek below Pepperdine Ranch	Rated section
North Fork Pit River below Thoms Creek	Rated section
North Fork Pit River near Alturas	Rated section

The record of the daily mean discharge at these stations is presented in Appendix A.

1963 Distribution

Watermaster service began on April 1 and continued until September 30, 1963.

New Pine Creek. Surplus water was available through the end of June, and was distributed on a correlative basis in accordance with the decree. On July 1 distribution started on a priority basis with third and a portion of fourth priority water available throughout July, this flow was not fully utilized however due to haying operations. Thereafter very little third priority water was available with second and first priorities being filled throughout the remainder of the season.

Cottonwood Creek. After the peak flow on May 20, Cottonwood Creek dropped rapidly through sixth and fifth priorities within two weeks. Some fourth priority water was available throughout June after which time the flow decreased steadily until about 20 percent of first priority water was available at the beginning of August. On August 28 water no longer reached the place of use on the Robnett Ditch and the total flow was therefore diverted into the Vincent pipeline.

Davis Creek. 1963 was one of the few years that the flow of Davis Creek was sufficient to fill fourth priority allotments for a significant length of time. One hundred percent of fourth priority allotments and some surplus water were available until June 4. The flow decreased to third priority within a week and then steadily decreased until only second and first priorities were filled by the end of the season.

Linville Creek. The flow of Linville Creek was sufficient to supply second priority allotments until May 25. After this time the flow decreased steadily until the middle of June when 53 percent of first priority allotments were available. The flow then remained constant for the rest of the season. The ground remained so wet in this area that the major upper user could not utilize his full allotment until late in June.

Franklin Creek. The flow of Franklin Creek was sufficient to supply all allotments until the first of June. The flow then steadily declined until the end of July when 12 percent of third priority allotments were available. The flow then remained fairly constant until September 15 at which time winter rights went into effect.

Joseph Creek. Distribution on a priority basis began on June 10, with fourth priority water available for the remainder of the month. During July the discharge of Joseph Creek receded steadily reaching first priority

level about the third week. A continued decline was noted, thereafter, until the seasonal low of 38 percent of first priority allotments was reached on August 15. Scattered rain showers and cooling weather accounted for fluctuations in the available water supply of from 40 to 80 percent of first priority allotments for the duration of the irrigation season.

Thomes Creek. Surplus water was available in this creek until July 11. Thereafter all second rights and part of third rights were satisfied through early September.

Gleason Creek. The flow of this creek was sufficient to fill fourth rights until the beginning of June. The flow dropped to second priority by the end of the month and decreased steadily until August 5 when the creek went dry at the water measurement station with all of the water being used upstream.

Shields Creek. After the peak runoff in May the flow dropped to full allotments in late June and then decreased slowly throughout the season. Most of the second priority water was still available at the end of the season. The Plum Canyon Dam which washed out during the October 1962 storm was rebuilt during August.

Parker Creek. The flow in Parker Creek reached a peak in late May and then dropped sharply until the first week of June. The Dorris Reservoir Ditch was shut down by the owners even before the water was required by North Fork Pit River users. Third priority water was available through July and August and then dropped to stock water only until the end of the season.

In July a new diversion dam was built by the U. S. Fish and Wildlife Service at the Dorris Reservoir diversion and the ditch was enlarged to increase its capacity.

North Fork Pit River. After the period of surplus water, which lasted until June 12, the flow dropped rapidly from fifth to first priority by the first week in July. After haying on the XL Ranch (U.S. Indian Service) in late July, water was released from Lauer Reservoir. By this time the lower users had only enough water for some sub-irrigation.

Seiad Creek Watermaster Service Area

General Description

The Seiad Creek service area is located in the northwestern part of Siskiyou County near the town of Seiad Valley. There are 11 water right owners with total allotments of 6.82 cubic feet per second. Seiad Creek, which is the source of supply for the area, has two tributaries (Canyon Creek and Darky Creek) which join the main stream from the north near the head of Seiad Valley. Seiad Creek traverses the northerly portion of the valley while the main body of agricultural land lies to the south.

The Seiad Creek service area comprises Seiad Valley and a narrow strip of land extending upstream from the head of the valley for a distance of about 2 miles. Seiad Valley extends from the mouth of the canyon for a distance of about 1 mile to the Klamath River which forms the western boundary of the area. The elevation of the valley is about 1,400 feet.

Gold dredging operations in the past have destroyed about 40 percent of the agricultural area within Seiad Valley. Up to the present time no effort has been made to reclaim any of the dredged lands for agricultural purposes.

Water Supply

Melting snow from higher elevations provides the main source of water supply to Seiad Valley with flows from springs and seepage providing some water in the summer and fall. The watershed of Seiad Creek stream system embraces the heavily forested, steep, mountainous area on the southern slopes of the Siskiyou range of mountains located in Siskiyou County. It ranges in elevation from 6,700 feet along the crest of the Siskiyou Mountains bordering the basin on the north to about 1,400 feet at the Klamath River on the south.

The stream system drains an area of about 29 square miles of which 17 square miles are tributary to the main stream, 9 square miles are tributary to Canyon Creek, and 3 square miles are tributary to Darky Creek.

Method of Distribution

Irrigation of the agricultural land is accomplished by the wild flooding method. Diverted water is used primarily for domestic gardens and lawns. Two of the diversions in use, 8 and 8A, are pump diversions for domestic water and are located on Canyon Creek. The distribution of the remaining water is by small ditches and laterals to the place of use.

1963 Distribution

Only diversions 2, 3, 7, 8, 8A, 10 and 12 were used during the 1963 season. Full allotments of water were not in demand and excess water flowed into the Klamath River all season. However, had all diversions been used there would not have been sufficient water available to satisfy all allotments.

Shackleford Creek Watermaster Service Area

General Description

The Shackleford Creek service area is located in the westerly portion of Siskiyou County near the town of Fort Jones in Scott Valley. There are 20 water right owners in the service area with total water right allotments of 63.98 cubic feet per second. The source of supply for this service area is Shackleford Creek located in the central part of Quartz Valley, and its tributary, Mill Creek, which rises east of the headwaters of Shackleford Creek. Evans Creek, a small stream is tributary to Mill Creek from the south. The service area covers the Quartz Valley region of Scott Valley which embraces the entire agricultural area within the Shackleford Creek basin. It is about 2 miles wide by 6 miles long with the main axis and drainage running from south to north. Elevations on the agricultural area range from about 3,100 feet at the south to about 2,650 feet at the point of confluence with Scott River.

Water Supply

The water supply for Shackleford Creek is derived from snowmelt runoff, springs and seepage, and supplemental stored water released from Cliff Lake and Campbell Lake located near the headwaters of Shackleford Creek.

The watershed of the Shackleford Creek stream system is about 31 square miles in the heavily forested, steep, mountainous terrain on the northeasterly slopes of the Salmon Mountains. It ranges in elevation from about 7,000 feet along its west rim to about 3,000 feet at the foot of the slopes bordering Quartz Valley.

The snowmelt is normally sufficient to supply all demands until the middle of July. The supply then decreases until the first part of August when water is released from Cliff Lake and Campbell Lake to maintain sufficient flow for the second priority rights in the Shackleford Ditch.

Method of Distribution

The primary method of irrigation is by wild flooding of permanent pasture and alfalfa fields. Water is distributed by ditches and laterals to the places of use. The largest of these ditches is Shackleford Ditch which has a length of about 6 miles and a capacity of about 12 cubic feet per second.

1963 Distribution

The available water supply in the Lower Shackleford Creek and Mill Creek areas was in excess of demands throughout the season.

The Upper Shackleford Creek area had sufficient water to satisfy first and second priority rights during the entire irrigation season. Supplemental water was released from Campbell Lake in August to insure the second priority right of its full allotment.

Four water stage recorders are maintained on the primary diversion ditches in the Upper Shackleford Creek area to insure accurate operation of these diversions. The recorders maintained are shown in the following tabulation.

Water Stage Recorders Maintained in
Shackleford Creek Watermaster Service Area
1963

Location	:	Type of control
Ralph Eastlick Ditch		3-foot rectangular weir
Shackleford Ditch		6-foot rectangular weir
Howard Jones Ditch		3-foot rectangular weir
Camp Ditch		3-foot rectangular weir

Records of the flow in these ditches are presented in Tables A-38, A-39, A-40, and A-41.

Shasta River Watermaster Service Area

General Description

The Shasta River service area is located in the central part of Siskiyou County in the vicinity of the town of Yreka. There are 103 water right owners in the service area with total allotments of 594.362 cubic feet per second.

The source of supply for this service area is Shasta River and its tributaries. Shasta River enters the south end of Shasta Valley near the town of Weed. It is joined by several tributaries, including Little Shasta River which joins Shasta River from the east near the town of Montague. Shasta River then flows out the north end of the valley near the town of Yreka to its confluence with the Klamath River.

The place of use is in Shasta Valley which is approximately 30 miles long and 30 miles wide. The valley has numerous small, cone-shaped, volcanic hillocks scattered throughout the central portion which have the effect of dividing the area into a number of distinctively separate parts. Of the approximately 507,000 acres within Shasta Valley, about 141,000 acres are irrigable due to this formation. The valley floor is at an elevation of approximately 3,000 feet.

Water Supply

The water supply for Shasta Valley is derived from snowmelt runoff and from spring and underground flow. The spring and underground flow is sufficient to supply nearly full allotments in several portions of the stream system throughout the season. Much of the underground flow apparently has its source on Mount Shasta which rises to an elevation of 14,162 feet at the south end of Shasta Valley. Although a normally heavy snowpack exists on Mount Shasta,

only negligible surface runoff occurs.

Parks Creek, Upper Shasta River, and Little Shasta River derive a major portion of their water supply from snowmelt runoff with the flow normally sufficient to supply allotments until the middle of May.

Beaughan Creek, Carrick Creek, Shasta River from Boles Creek to Dwinnell Reservoir, Big Springs, and Lower Shasta River normally have sufficient spring flow to supply a large percentage of the allotments throughout the season. Records of the flow at several gaging stations throughout the area are presented in Tables A-42 through A-53.

Methods of Distribution

Irrigation of permanent pasture and alfalfa lands is accomplished by the wild flooding method. Much of the waste water is recaptured and used on lower pasture lands. The use of sprinkling systems is employed in the irrigation of some alfalfa and grain lands.

Water is diverted in the area primarily by diversion dams and then conveyed by ditch or canal to the place of use. The largest and longest canal in the area is the Edson-Foulke Yreka Ditch, which has a capacity of about 60 cubic feet per second and a length of about 15 miles. Water is also distributed into ditch systems by pumped diversions. Generally these are the irrigation district pump installations, although many riparian water right users employ pump diversions.

Many privately owned storage reservoirs are found in the area. This stored water is mainly used during the irrigation season to supplement continuous flow allotments. Several of these reservoirs are also used for regulatory storage of natural flow allotments.

1963 Distribution

To facilitate an equitable distribution of water and to obtain records of streamflow, 11 water stage recorders were maintained. The locations of the recorders were as follows:

Location	Type of Control
Parks Creek above Edson-Foulke Yreka Ditch	Rated section
Edson-Foulke Yreka Ditch North of Parks Creek	Rated section
Edson-Foulke Yreka Ditch at Shasta River	5-foot Parshall flume
Robertson Weir near Parks Creek	8-foot rectangular weir
Carrick Creek at Highway 97	3-foot rectangular weir
J. N. Taylor Ditch	4-foot rectangular weir
M. L. Miller Ditch	1-foot Parshall flume
K. Waters Ditch	3-foot rectangular weir
Big Springs Lake	Staff
Big Springs I. D. Flume	Rated section
Shasta River at Montague Bridge	Rated section

Parks Creek. The water supply this season was much improved over that of 1962. There was sufficient flow to satisfy all priorities until July. The Edson-Foulke Yreka Ditch diverted water until early August at which time the flow dropped off rapidly. The first priority, a total of 6.0 cubic feet per second, received the full amount throughout the season. Other priorities received a portion of their allotments during the latter part of the season from return irrigation flow and from water that reappeared in the gravel streambed. The Montague Water Conservation District's Parks Creek Feeder Canal to Shasta River was shut off in early June. Dwinnell Reservoir, which received the flow of the feeder canal, was near full capacity at the time.

Beaughan Creek. The creek was measured below Beaughan Spring on September 11, at which time the rate of flow was 7.7 cubic feet per second. This amount was sufficient to supply about 93 percent of second priority allotments. The creek is routed through the mill pond owned by International Paper Company who is allowed to use about 35 percent of the flow for industrial purposes. Intermittent observations made at the Parshall flume below the mill pond during 1963 are presented in the following tabulation:

Date	Discharge in second-feet	Date	Discharge in second-feet
July 8	8.0	August 20	6.3
July 16	8.0	September 6	6.8
July 30	6.8	September 9	6.0
August 14	6.8		

Carrick Creek. The water supply was sufficient to supply main stream allotments all season, except for the ninth priority which was occasionally shorted. The flow of Carrick Springs is determined by adding diversions 116 and 117, and the flow of the creek as measured at the Highway 97 water stage recorder.

Shasta River from Boles Creek to Dwinnell Reservoir. Boles Creek and Shasta River below Boles Creek to Dwinnell Reservoir were operated as one stream with water being distributed on an equal and correlative basis. There was sufficient water available throughout the season to satisfy the allotments of the diversions in use.

Upper Shasta River. The Edson-Foulke Yreka Ditch diverted the entire flow of Upper Shasta River beginning July 1 and extending through the remainder of the season.

Dwinnell Reservoir. Reservoir releases from Dwinnell Reservoir to the Montague Water Conservation District commenced on April 19, 1963, and continued through October 10, 1963. Reservoir operation data for the 1963 season are shown in Table A-51.

By agreements with the Montague Water Conservation District, natural flow water rights below Dwinnell Reservoir are met upon demand by the release of stored water to the water right owner in lieu of natural flow rights. The agreement allotment totals and seasonal amounts delivered to each user are shown in the tabulation below.

In some cases, total allotments were not delivered because cold wet weather during the early spring months reduced the irrigation requirements.

DELIVERIES TO NATURAL FLOW WATER RIGHT OWNERS
BELOW DWINNELL RESERVOIR 1963

Name of water right owner	Allotment per agreement, in acre-feet	Amount delivered from Dwinnell Reservoir	
		Acre-feet	Percent of allotment
E. Love	198	188	95
Marvin Miller and Inez M. Miller	924	727	79
K. K. Waters and Emily S. Waters	464	352	76
J. N. Taylor	1,200	1,180	98
W. W. Valentine, Jr.	595	0	0
TOTALS	3,382	2,447	72

Big Springs. The Big Springs water supply was more than adequate to meet all water right demands during the 1963 season. Records of water pumped by the Big Springs Irrigation District are shown on Table A-43.

Lower Shasta River. The streamflow of the Lower Shasta River met all water right requirements. This abundant water supply allowed the Shasta River Water Users Association and the Grenada Irrigation District to receive their full allotments for the season. Daily operational data are set forth in Table A-52 for Shasta River Water Users Association. Operational data for the Grenada Irrigation District are not available for the 1963 season. It is anticipated that during the 1964 irrigation season the watermaster will maintain a water stage recorder at the District's diversion point.

Little Shasta River. Due to the streamflow characteristics of Little Shasta River, regulation is required early in the season. Water was available to satisfy 100 percent of the fifth priority rights until June 13 when regulation became necessary to satisfy higher priority rights. A record of the daily mean discharge of Little Shasta River near Montague is presented in Table A-47.

Two diversion dams were constructed on the Little Shasta River during the 1963 season. These dams were constructed by the Musgrave and Linton ditch owners and the Hart, Haight and Prather ditch owners at their respective points of diversion.

South Fork Pit River Watermaster Service Area

General Description

The South Fork Pit River service area is located primarily in Modoc County with a small portion extending into the northern part of Lassen County. There are 37 water right owners in the area with total allotments of 336.00 cubic feet per second.

The source of water supply for this service area is the South Fork Pit River and its tributaries which rise on the western slopes of the Warner Mountains. The main stream enters South Fork Valley near Likely and then turns north to its confluence with North Fork Pit River at Alturas. South Fork Pit River is joined by Fitzhugh Creek near the middle of the valley and by Pine Creek just south of Alturas.

The major area of water use is in South Fork Valley between the towns of Likely and Alturas. South Fork Valley is about 16 miles long and 3 miles wide with the valley floor lying at an elevation of about 4,500 feet. The valley is bounded on both sides by a rocky plateau separating it from the surrounding mountains.

Water Supply

The water supply for Pine Creek is derived primarily from snowmelt runoff from relatively high mountains. The runoff, generally small in the early spring, increases to a peak in May as temperatures rise. During June and continuing throughout the season, stream flow in Pine Creek decreases requiring the water users to supplement their irrigation supplies from other sources where available.

The water supply for Fitzhugh Creek consists of snowmelt runoff early in the season and is supplemented by water diverted from Mill Creek above Jess Valley later in the season. Surplus water from Fitzhugh Creek is normally diverted into the Payne and French Reservoirs through Payne-French Ditch (Diversion 136) until June, when the diversion is closed to supply downstream allotments. By July, the creek has normally receded until only first priority allotments are available.

The Payne Ditch (Diversion 1) is opened to import water from Mill Creek to Fitzhugh Creek as soon as the snow has melted enough to allow access. This foreign water is rediverted from North Fork Fitzhugh Creek through the Bowman Ditch to the Bowman Ranch. The return flow from the Bowman Ranch to the creek is then rediverted through Diversion 136 for stockwatering purposes in the Payne-French Ditch.

The water supply for South Fork Pit River is derived primarily from the snowmelt runoff of a number of streams which rise at high elevations and collect at the mouth of Jess Valley to form the South Fork proper and from West Valley Reservoir located on West Valley Creek which enters the river below Jess Valley.

Most of the users on South Fork Pit River, except those in Jess Valley, are in the South Fork Irrigation District. This district stores water in West Valley Reservoir, which has a capacity of 22,240 acre-feet, and releases it to the South Fork Pit River as a supplemental supply at such times as the natural flow becomes insufficient to supply demands. It is normally necessary to begin releasing water from the reservoir about the middle of June when the natural flow is no longer sufficient to meet demands. This water together with the natural flow is distributed by the watermaster in cooperation with the Board of Directors of the irrigation district. The natural flow combined with the stored water is normally sufficient to supply

all demands for water on the South Fork Pit River throughout the irrigation season. The daily mean discharge at various stations throughout the area are presented in Tables A-54 through A-60. The releases from West Valley Reservoir and the flows of South Fork Pit River near Likely are presented graphically on Plate 3.

Methods of Distribution

On the tributary streams, the water is distributed on a continuous flow basis through each users individual ditch with the fields being flooded through small lateral ditches. The users on the South Fork Pit River generally use the check and border method of irrigation. They normally receive water on a demand basis supplemented by water released from West Valley Reservoir. This must be modified to eliminate large peak demands from the reservoir and to utilize return flow as much as possible. The actual distribution of this water varies each year as there is no specific irrigation schedule in use.

1963 Distribution

Watermaster service began in the South Fork Pit River service area on April 13, and continued through September 30.

Pine Creek. An abundant supply of irrigation water existed ~~early in the season~~ FROM MAY 20 TO JULY 20 on Pine Creek ~~ending a four year drought period.~~

Exceptionally high flows occurred ~~in early February and again in May. Total runoff during May was among the highest for that month in recorded history, due~~ ON JUNE 10 CAUSING MINOR FLOOD CONDITIONS, in large part to the heavy rains of that period. Precipitation records show 2.60 inches for April in 14 days and 2.22 inches in 13 days of May. During the latter part of the summer flows decreased sharply and were mostly below normal for the remainder of the irrigation season. A seasonal low of 10 cubic feet per second occurred in late September.

Pine Creek surplus flow was diverted into Dorris Reservoir during April, May and part of June as the capacity of the main channel of Pine Creek below Diversion 5 is about 20 cubic feet per second and could not carry the flow. Dorris Reservoir filled to capacity in the early spring. AND SPILLED FOR THE FIRST TIME SINCE THE RES. WAS ENLARGED IN 1948.

Pine Creek Reservoir which was formerly owned by the California-Oregon Power Company is presently owned by the State Wildlife Conservation Board and is maintained and operated by Modoc County. This season the reservoir was operated by the watermaster on an informal basis (it is not in the watermaster service area). The inlet works, in poor operating condition, made proper regulation difficult if not impossible at times.

Fitzhugh Creek. Payne and ~~French~~ Reservoirs filled to capacity during ~~March~~ JUNE with surplus water available in Fitzhugh Creek ~~until the middle of~~ FROM June. There was sufficient water to supply approximately 25 percent of the second priority allotments from the first part of July until the end of the season. The Pit River Ranch which is the lower most user on the creek had their Fitzhugh Creek land fallow and consequently there was enough water in the lower portion of the creek to supply the demand.

The Payne Ditch which imports water from Mill Creek was opened on June 26. Recorders were maintained at the head of the Bowman Ditch and in the creek below the ditch to assist in the rediversion of this foreign water along with the distribution of the natural flow. Only a portion of first priority allotments were available from North Fork Fitzhugh Creek during the latter part of the season while second priority allotments were available in other portions of the stream system. The records of these flows are presented in Tables A-57 and A-58.

South Fork Irrigation District. The problems in this area were of distribution rather than of supply. West Valley Reservoir provides the main

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source of water storage for the district. A sufficient water supply existed throughout the season to provide ample irrigation for all lands in the district. The reservoir filled to capacity on April 6 and discharged water over its spillway from that date until July 18. Stored water was then released until September 17 at which time the reservoir gates were closed for the season. On this date there was 10,800 acre-feet of water stored in the reservoir.

A water stage recorder was installed 0.5 miles below West Valley Reservoir in West Valley Creek for purposes of maintaining a continuous record of releases. These records are presented in Table A-56. The total flow at this station from April 6 through September 17 was 17,200 acre-feet of which approximately 6,000 acre-feet flowed through the spillway.

Surprise Valley Watermaster Service Area

General Description

The Surprise Valley service area is located in the extreme eastern part of Modoc County. There are 177 water right owners in the service area with total allotments of 315.23 cubic feet per second. The source of supply is comprised of 10 individual creek systems rising on the eastern slope of the Warner Mountains. These streams are fed by snowmelt runoff and pursue a fast precipitious course down the Warner's eastern slope to the valley floor, at which point numerous and scattered diversion ditches convey water to the irrigated lands. Nearly all of the place of use is the irrigable lands situated in a long, narrow area between the foot of the Warner's and the Alkali Lakes, which lie in the center of Surprise Valley.

Surprise Valley extends in a north-south direction approximately 50 miles with an average width of 8 to 10 miles and is bordered on the north, south, and west by the rugged Warner Range and on the east by the typical mountainous desert terrain of Nevada. The valley floor is at an elevation of approximately 4,700 feet.

Water Supply

The water supply is derived almost entirely from snowmelt runoff with only minor spring fed flows occurring in the latter part of the season. There are no economically feasible storage sites on the service area creeks. Because of this lack of regulation, the available water supply at any specific diversion point may vary immensely within a few hours as rising or falling temperatures from day to night combine with the relatively short and steep drainage areas to promote these fluctuations of flow.

Additionally, occasional summer thunder showers may cause a creek to discharge a flow of mammoth proportions for several hours. These flashes are apt to cause considerable damage in washouts and debris deposition, and are of such short duration that no beneficial use can be made of the water. Records of the daily mean discharge of the various streams within the service area are presented in Tables A-61 through A-71.

Method of Distribution

The continuous flow method of distribution is employed on most creeks; however, in a few instances the available water supply is rotated among the users in accordance with either decree schedules or a program mutually acceptable to the users.

Alfalfa and meadow hay, the major crops grown in the valley, are irrigated in most instances by wild flooding. There are also considerable lands dependent upon subsurface irrigation. In addition, recent development of numerous deep wells has popularized the sprinkler method of irrigation. This latter method will of necessity be limited in future growth both by available ground water supply and costs of installation and maintenance.

To facilitate distribution of irrigation waters a program of constructing permanent diversion dams, headgates, and measuring devices has been initiated in recent years. Although the basic problems of discharge variation and debris deposition are virtually unsolvable, these control devices afford considerable assistance to the watermaster in coping with the normal distribution problems.

1963 Distribution

Watermaster service began in the Surprise Valley service area on March 19, 1963 and continued until September 30. The 1963 season must definitely be considered as an excellent one for irrigation purposes.

The end of a four year drought period came in October 1962 with a heavy rainstorm of record breaking proportions. A second heavy rainstorm in late January and early February further contributed to replenishment of ground water supplies.

Although the Warner Mountains were virtually devoid of any snowpack at the beginning of the irrigation season a continual light snowfall during the latter part of March and the entire month of April, combined with light rains in May and June, was sufficient to maintain an adequate water supply in most creeks until the first cutting of hay.

Flows in most creeks dropped sharply as soon as the warm weather began, reflecting the lack of early snowpack on the Warner Mountains. All creeks produced seasonal runoffs in the range of from 90 to 110 percent of their long-time averages. However, excellent soil moisture conditions, throughout the spring provided a usable water supply well above average. All mountain springs were in good condition through most of the season. Artesian wells in the meadow lands flowed extremely well, further contributing to the overall water supply. All sub-irrigated ranches had adequate water supplies, as did the several "dry farms" in the valley.

Because of the very wet month of April, however, many ranchers were delayed several weeks in preparation of their crop lands. The general haying season was also delayed, however, in most instances the best yields since 1958 were achieved.

Total precipitation records for both October and April were broken at Cedarville (See Table 3). A total of 2.96 inches of moisture was recorded there in April. The long-time average precipitation for April, May and June at Cedarville is 2.79 inches. In 1963, total precipitation for these months

was 6.59 inches or approximately 236 percent of the long-time average for that period.

Although farm operations were delayed and much flood damage experienced, the water proved to be far more beneficial than harmful as optimum irrigation and crop yield were achieved.

Bidwell Creek. Total stream runoff of Bidwell Creek during the irrigation season from March 1 through September 30 was approximately 13,340 acre-feet (See Table A-61). Since Bidwell Creek has been under watermaster service a relatively short time, since 1955, records are not available to accurately determine the mean seasonal runoff.

Throughout April, May, and early June there was ample water available for all priorities and as a result few difficulties in distribution were encountered. From late June and continuing throughout the remainder of the season, the discharge of Bidwell Creek receded at a fairly steady rate finally reaching a low of approximately 4 cubic feet per second during the latter part of September. This amount was adequate for all first priority allotments.

In keeping with the general policy of the department, the watermaster, while not responsible for continual surveillance of ditch systems, set up a rotation program for certain of the town users at their request. This program proved satisfactory and appears to be the best method for resolving the problems among numerous owners of small water rights located on the same ditch.

Mill Creek. Total stream runoff available to Mill Creek users during the irrigation season was 5,500 acre-feet or approximately 94 percent of normal.

An abundant water supply existed throughout April and May with much of the surplus flow in Mill Creek wasting into Upper Alkali Lake. On June 3 the flow was insufficient to supply all allotments (See Table A-62). From then until mid-July third priority water was available in steadily decreasing quantities. Second priorities were shut off in early August. Throughout the remainder of the season first priority allotments were served in generally decreasing amounts until the seasonal low of approximately 50 per cent of the first rights was reached in late September.

In late summer the large number of small domestic, and stockwater rights, combined with the channel loss and the relatively great distance between diversion points created a serious distribution problem. In an effort to alleviate this problem several screw type headgates, concrete weir boxes, concrete division boxes, and adjustable metal rectangular weirs were installed in the various diversion ditches.

It is anticipated that during the 1964 season the remaining diversion points will be effectively controlled through construction of adequate headgates and measuring devices.

Soldier Creek. Total stream runoff available to Soldier Creek users during the irrigation season was 3,600 acre-feet (See Table A-63) or approximately 89 percent of normal.

Although a below normal runoff existed, all lands were adequately supplied with irrigation waters through late May. Several ranches did not use their full allotments during this early period due to the excellent soil moisture conditions derived from the spring storms.

Surplus water was available to the J. V. Patch Ranch during several days in April and through most of May. This ranch, which depends

almost entirely upon surplus water (supplemented by a small fifth priority right and some sub-irrigation from the neighboring upstream ranches) experienced its first good irrigation since 1958.

During the period of surplus flow the four permit right users did not take full advantage of these seldom filled allotments as their lands were nearly saturated from the storms.

Irrigation priorities were closely regulated only during the last two rotation periods between May 27 and June 19. After that date the flow of Soldier Creek decreased at a fairly constant rate. First priorities were satisfied until mid-July after which the available water supply continued to recede until the seasonal low of 50 percent of first priorities was reached in late September.

No major construction was accomplished on Soldier Creek in 1963, although several of the rock and log diversion points were obliterated by the previous October storm. They were replaced on a temporary basis. It is anticipated that an agreement will be reached among the upper users during the 1964 season in order that adequate concrete control structures may be constructed at their diversion points.

It is again recommended that a Parshall measuring flume be installed at a point near the lower end of the West Channel.

Pine Creek. Total stream runoff available to Pine Creek users during the irrigation season was 1,520 acre-feet (See Table A-64) or approximately 107 percent of normal.

The stream system was operated according to the rotation schedule as set forth in the court decree.

Unexpected water was available to all users as the Eastlick Ranch did not begin any irrigation until mid-May. As a result it was possible to

complete three rotation cycles and advance well into the fourth.

On May 27 the flow in Pine Creek dropped below 4.0 cubic feet per second ending the rotation season. From this date through June 9 the flow was divided between the Andrae and Eastlick ranches. As the flow further receded to 1.6 cubic feet per second the entire creek was turned into the South channel for use by R. Bordwell for about two weeks or as long as it would reach the place of use. The Cressler Ditch had been damaged by flood water and could not be used during this period.

The winter storms destroyed portions of the old concrete division structure at the main channel split. It is recommended that a new reinforced concrete division dam with adequate measuring devices be constructed in 1964.

Cedar Creek. Total stream flow available to Cedar Creek users during the irrigation season was 4,420 acre-feet (See Table A-65) or approximately 135 percent of normal. Water was available for the third and fourth priority users from April 6 through May 22. Surplus water flowed into Middle Alkali Lake during most of this period as optimum levels of irrigation had been attained. Many ranches used less then their allotments due to the excellent soil moisture content.

Second priority regulation began May 25 with the creek flow declining steadily thereafter. During this period the downstream users, beginning at Diversion 8, agreed to rotate their water supply among themselves. This method, employed during the previous two seasons, has proven to be efficient. A complete rotation of all second priority rights is not feasible at this time because of both the inadequacy of some of the upper user's control and measuring devices and the great distances involved.

The entire stream flow was turned to the only first priority user on June 18 and remained with him throughout the duration of the season.

The new concrete diversion structure placed in use this season, combining diversion points 8, 9, and 10, proved to be of great value in control and distribution work.

At the close of the season a new concrete diversion dam with screw-type headgate and a two foot concrete Parshall measuring flume were built to serve the Allen Ranch. The diversion dam was tied into the Watson Dam for economy of construction. A small concrete division box was also constructed in the Street Ditch, Diversion No. 8, at the Bunyard Ranch lateral. This structure is designed to automatically distribute the available water supply between the Bunyard Ranch and the two lower ranches.

Deep Creek. Total stream runoff available to Deep Creek users was 4,280 acre-feet (See Tables A-66 and A-67) or approximately 108 percent of normal. An adequate water supply existed to fulfill all allotments until the end of May at which time the stream flow began receding.

From June 1 through the end of the irrigation season the entire flow of North Deep Creek was diverted by the Company Ditch, as only first priority water was available.

Second priority regulation began on South Deep Creek June 1 and continued through June 10. Throughout the remainder of the irrigation season first priority water only was available in steadily declining amounts.

Third, fourth and fifth priority users received possibly as good an irrigation in April and May as they have ever had, much of it from sub-irrigation.

It is recommended that concrete Parshall flumes be constructed in the Sharp-Messier Ditch and also in the House Ditch as soon as it is practical.

The early winter storms destroyed much of the rip-rap work which had been placed last fall on the south bank of the creek downstream from the

Sharp-Messier diversion dam. Corrective measures should be taken in the near future.

Owl Creek. Total stream runoff available to Owl Creek users was 7,260 acre-feet (See Table A-68) or approximately 111 percent of normal.

The flood control and distribution project continued to provide excellent means of equitable distribution of irrigation waters. Despite several periods of apparently record runoff, little physical damage was sustained by the project facilities. However, during the October 1962 and January-February 1963 storms, the creek jumped its banks at a point near the lower end of the main flume. The first division box, the north division box and a section of the flume near the first division box were filled with silt, rock, and debris. This material was cleaned out prior to the irrigation season and no further difficulty of this nature was experienced.

For the first time since the project's construction in late 1960, Owl Creek provided enough flow to run the distribution system at capacity levels. A high of 66 cubic feet per second, approximating the design flow, was observed on several occasions passing efficiently through the system. This flow was entirely adequate to supply all demands for water from the system.

Full priority allotments including the Allen-Arreche Ditch were available for most of May and June. During the fourth week of June, the flow declined rapidly cutting off many of the twenty-one decreed priority rights. The flow then gradually receded from the first part of July throughout the remainder of the irrigation season.

The "special" eighth priority allotments were fulfilled during their respective periods for the first time since 1958. Stockwater only was available after August 11, as the flow continued to recede.

Rader Creek. Total stream runoff available to Rader Creek users was approximately 3,600 acre-feet (includes estimated flow of 200 acre-feet from April 1 - April 15 - see Table A-69) or approximately 100 percent of normal. All users received ample irrigation water until late June. As the discharge started to recede, close regulation was required to maintain an equitable distribution. Diversion number 1 was closed July 27 as there was no longer sufficient water available to reach the place of use. The stream flow receded steadily throughout the remainder of the irrigation season. Second priority rights were terminated on August 31. Thereafter first priority water in varying amounts was available.

Rectangular weir boards with metal facings were installed at the Minto, Dollarhide, and Grace diversion complex. These proved highly successful in maintaining a new automatic dividing system during the periods of lower flow. A continuing distribution problem exists, however, during the periods of higher flow due to the large quantities of sand and gravel present.

It is recommended that a concrete measuring device be installed in the Glouster Ditch number 2. It is further recommended that consideration be given to an overall plan for a new distribution system at the Minto, Dollarhide, and Grace diversion complex together with a possible channel realignment upstream from this point for approximately one quarter mile.

Eagle Creek. Total stream runoff available to Eagle Creek users was approximately 5,260 acre-feet (See Table A-70) or approximately 84 percent of normal.

An ample water supply was available to all users until the fourth week in June at which time a sharp reduction in flow was noted. Thereafter a steady decline took place. On July 26 all third priority water was turned

to the Grace Ranch, as channel losses were excessive in the lower reaches of the creek. Second priorities were shut off in mid-August and thereafter only first priority water was available. Although at times only 75 percent of the first priorities were being served, all users were supplied with adequate quantities through careful regulation and the non use of several of the garden water priorities.

Four screw-type headgates are to be installed in the Gee and Grider division boxes prior to the 1964 irrigation season. A concrete division box is also being planned in the Grider Ditch at the Town User's-Grace Ranch split.

Emerson Creek. Total stream runoff available to Emerson Creek users was 3,500 acre-feet (See Table A-71) or approximately 91 percent of normal.

All priorities were fulfilled until approximately June 1. With the exception of a flash flood on June 16, the flow in Emerson Creek receded steadily throughout the remainder of the irrigation season.

Third and fourth priorities were shut off June 1 and June 8 respectively. Although some second priority water was available well into August, little effective irrigation was accomplished after mid-July. First priority allotments were satisfied throughout the remainder of the season.

The flood of mid-June greatly damaged the Taylor Ditch number 1. However, no immediate problem was encountered as this ditch has not been used for several years due to an inactive ranch operation. It is anticipated that the ditch owner will make repairs to his diversion point prior to the 1964 irrigation season.

Emerson Creek users again supplemented their second crop irrigation supply by use of their several deep wells.

Susan River Watermaster Service Area

General Description

The Susan River service area is located in the southern part of Lassen County in the vicinity of the town of Susanville. There are 166 water right owners in the service area with total allotments of 351.922 cubic feet per second. The source of supply is comprised of three stream systems as follows: Susan River and tributaries, Baxter Creek and tributaries, and Parker Creek.

Susan River has its sources on the east slope of the Sierra Nevada Mountains in the southwesterly portion of Lassen County immediately east of Lassen National Park at an elevation of about 7,900 feet. Its channel runs easterly from Silver Lake through McCoy Flat Reservoir, through Susanville, and on to Honey Lake.

Susan River has four major tributaries; Piute Creek (entering from the north at Susanville), Gold Run and Lassen Creeks (entering from the south between Susanville and Johnstonville), and Willow Creek (entering from the north above Standish). Gold Run Creek and Lassen Creek rise on the north slope of Diamond Mountain at an elevation of about 7,600 feet. The watersheds of Piute Creek and Willow Creek are lower and they rise on the south slopes of Round Valley Mountains.

A short distance below the confluence of Willow Creek with Susan River the river channel divides into three branches known as Tanner Slough Channel on the north, Old Channel in the middle, and Dill Slough Channel on the south. Two channels which take off of Dill Slough on the south are known as Hartson Slough and Whitehead Slough.

The Baxter Creek stream system is situated in Honey Lake Valley on the east slope of the Sierra Nevada about 10 miles southeast of Susanville in

the southern portion of Lassen County. The principal streams in the Baxter Creek stream system are Baxter Creek (which rises in the extreme western portion of the basin and flows in an easterly direction), Elesian Creek, Sloss Creek, and Bankhead Creek (tributary to Baxter Creek from the south). Elesian Creek has three tributaries: North Fork Elesian Creek, South Fork Elesian Creek, and Kanavel Creek.

Parker Creek is situated in Honey Lake Valley on the east slope of the Sierra Nevada about 15 miles southeast of Susanville in the southern portion of Lassen County. It has its source on the east slope of Diamond Mountain and flows in an easterly direction for about 5 miles into Honey Lake.

The place of use in the Susan River service area is primarily in Honey Lake Valley between Susanville and the northwest shore of Honey Lake, a distance of about 25 miles. The valley floor is at an elevation of about 4,000 feet.

Water Supply

The water supply in the Susan River service area comes from two major sources; snowmelt runoff and springs. The snowpack on the Willow Creek Valley and Piute Creek watersheds, which embrace more than one-half of the Susan River stream system, melts early in the spring and usually is entirely depleted by the first of May. The irrigation requirements from this portion of the stream system after the first of May are almost entirely dependent upon the flow of perennial springs which remain fairly constant throughout the year.

Under normal conditions the flows of Lassen Creek, Gold Run Creek, Baxter Creek, and Parker Creek and of Susan River above Susanville are fairly well sustained by melting snows until early in June. The flow from perennial springs in this portion of the water system is comparatively small. The

Lassen Irrigation District stores supplemental water in Hog Flat Reservoir and McCoy Reservoir, located on the headwaters of the Susan River. This stored water is released into the Susan River channel and commingled with the natural flow usually during June and July. It is then rediverted into Lake Leavitt for further distribution by the irrigation district. Records of this flow are presented in Table A-77 and on Plate 4. Records of the daily mean discharge of the various streams in the service area are presented in Tables A-72 through A-78.

Methods of Distribution

Irrigation in the Susan River service area is accomplished by placing diversion dams in the main channel of the stream system to raise the water to the level required to divert it into the canals and diversion ditches. These diversion dams are relatively large on the Susan River channel and much smaller on the tributaries. Various methods of irrigation are practiced; the most common is wild flooding. In this method water is conveyed by a main ditch to the high point of the land to be irrigated. It is then distributed by laterals along the higher ridges of the tract from which it is allowed to spread at random over the area served by the ditch system. Some portions of the irrigated lands have been leveled permitting a more efficient use of water than is possible under the wild flooding method. Border checks and furrows are being put to wider use. Sub-irrigation occurs in some areas incidental to surface irrigation or as a result of seepage from ditches or creek channels.

During the period the Lassen Irrigation District is releasing water from their upstream storage reservoirs, no practical method exists to determine the natural flow in the Susan River. Experience indicates that

a reduction of approximately 10 percent per week in the natural flow of the river could reasonably be expected. Therefore, an agreement between the district and the watermaster provides that the watermaster will during these periods of release, reduce by 10 percent each week the total flow available for distribution purposes at the diversion points under his jurisdiction which are ordinarily served by the natural flow in the Susan River.

1963 Distribution

Parker Creek. Parker Creek held up well until about July 1, at which time the available water supply fulfilled approximately 50 percent of the second priority allotments. The flow declined rapidly until 100 percent of first priority water was available about July 25. This level was maintained for the rest of the season with stockwater available to all of the users.

Baxter Creek. The available water supply in Baxter Creek was sufficient to supply all priorities until approximately June 1. The cold spring weather, retarding the snowmelt, created this exceptional condition. Approximately 50 percent of the third priority allotments were supplied in early June with the flow slowly declining thereafter. On July 1, 50 percent of the first priority allotments were served. After July 25, stockwater only was available throughout the stream system.

Lassen-Holtzclaw Creek. The water supply in Lassen-Holtzclaw Creek was sufficient to supply all priorities until July 1. Throughout the remainder of the season the Hulsman Ranch was entitled to all the water available in this stream system.

Hills Creek. The water in Hills Creek was sufficient to supply all allotments until about July 1. On July 20, approximately 40 percent of

the total allotments were being served. From August 1 through the remainder of the season only stockwater was available. All the storage facilities on Hills Creek were filled during the spring runoff.

Gold Run Creek. The streamflow in Gold Run Creek was sufficient to supply all allotments until about June 5. On July 1, the flow had receded so that 100 percent of the second priorities were being served. This further declined until July 15, afterwhich, stockwater only was available.

Willow Creek. The snowmelt runoff produced a reasonably good water supply in Willow Creek during the early spring, however, in the latter part of the year the spring-fed portion of the flow was below normal. In June, 50 percent of second priority allotments were available, and by mid-July, the available water supply had decreased to the seasonal low point of approximately 35 percent of the second priorities. Thereafter the flow increased until about 45 percent of second priority allotments were available at the end of the irrigation season.

Due to the fact that the channel of Willow Creek below the lower boundary of the Barron Ranch was cleaned by Mr. Hanson after the 1961 irrigation season, water was able to flow freely off the Barron Ranch for most of the summer. The growth in the channel created a backwater problem at the lower end of the Barron Ranch during the early part of July. A chemical solution was used in this area, but apparent improper application greatly neutralized its effect upon this growth problem. However, by drying up the channel during the haying season, much of the moss was killed.

Susan River. The water supply in the Susan River was sufficient to satisfy all demands until early July. The flow then decreased rapidly until 35 percent of the second priority allotments in the upper Susan River area were being served on July 10. From August 1 through the remainder of

the irrigation season, 10 percent of the second priority allotments were available to the upstream users. In the lower Susan River area, 100 percent of the second priority allotments were served until about July 1. The water supply then decreased rapidly until early August after which only stockwater was available.

Storage Reservoirs. The storage reservoirs in the Lassen Irrigation District system provided an ample water supply for their needs.

McCoy Reservoir filled to capacity early in the season, discharging flow over its spillway during this period. At the end of the irrigation season the reservoir's water level stood at approximately 30 percent of capacity.

Hog Flat Reservoir, while never reaching capacity, stored an amount well above average. As is customary, it was drained early in the year eliminating seepage and evaporation losses.

APPENDIX A

STREAMFLOW RECORDS

APPENDIX A

STREAMFLOW RECORDS

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TABLE A-1

DAILY MEAN DISCHARGE
OF ASH CREEK AT ADIN

March through September 1963
(In second-feet)

Day	March	April	May	June	July	August	September
1	91	302	212	67	21	21	15
2	85	184	213	54	20	21	13
3	82	157	244	49	17	20	13
4	71	145	223	48	17	22	8.5
5	73	195	208	53	18	22	7.3
6	73	1,180	197	49	18	20	6.8
7	67	1,410	193	39	18	20	7.5
8	64	929	202	33	18	20	6.8
9	60	691	353	30	15	23	6.3
10	53	546	246	29	15	23	6.9
11	52	473	306	34	15	26	8.2
12	48	339	252	30	16	26	9.7
13	45	270	218	28	15	23	12
14	49	302	219	28	16	22	18
15	55	321	203	22	16	23	18
16	60	292	183	24	16	21	18
17	60	283	171	27	15	22	18
18	63	256	159	16	21	21	21
19	87	282	150	11	28	21	26
20	116	439	142	16	22	21	37
21	104	376	135	16	19	20	32
22	79	360	143	26	20	21	34
23	70	281	145	28	21	22	35
24	67	238	126	29	21	23	28
25	60	230	98	25	21	23	23
26	56	286	87	23	26	21	20
27	75	261	74	19	24	20	19
28	260	215	56	25	20	21	19
29	255	205	57	35	15	21	20
30	173	205	79	26	18	21	20
31	370		72		19	22	
Mean	94.3	388	173	31.3	18.7	21.7	17.6
Runoff in acre-feet	5,800	23,110	10,640	1,860	1,150	1,340	1,040

TABLE A-2

DAILY MEAN DISCHARGE OF RUSH CREEK
NEAR ADIN

March through September 1963
(In second-feet)

Day	March	April	May	June	July	August	September
1	22	56	29	15	3.6	2.1	3.0
2	21	55	30	15	3.7	3.7	2.9
3	20	56	35	14	3.7	3.3	3.0
4	18	52	33	13	3.5	3.3	2.6
5	19	74	30	12	3.5	3.5	2.5
6	18	321	29	11	3.2	3.1	2.3
7	17	353	30	10	3.3	2.7	2.1
8	15	175	32	9.0	3.6	2.9	2.0
9	13	114	45	8.4	3.8	2.9	2.1
10	13	83	35	8.7	3.7	3.0	2.3
11	12	68	39	7.4	3.6	3.0	2.3
12	12	56	32	6.5	3.6	3.0	2.4
13	11	51	29	6.3	3.6	3.0	2.9
14	11	57	27	6.1	3.7	2.1	2.9
15	12	57	25	5.5	3.7	2.1	2.7
16	12	52	23	7.1	3.6	2.0	2.8
17	12	52	22	5.9	3.7	1.9	2.4
18	11	46	22	4.7	3.7	1.9	2.3
19	16	43	21	4.2	3.6	1.9	2.5
20	22	45	21	4.0	3.4	1.8	2.5
21	20	40	20	4.0	3.5	2.0	2.5
22	17	50	20	4.3	3.5	2.1	2.6
23	17	41	20	4.0	3.3	2.1	2.5
24	17	37	17	3.8	3.3	2.0	2.4
25	14	35	17	3.8	3.3	2.0	2.4
26	14	41	16	3.4	3.3	1.9	2.6
27	22	34	16	3.3	3.3	1.9	2.7
28	47	30	16	4.2	3.4	2.2	2.7
29	61	29	15	4.3	3.4	2.5	3.1
30	52	30	15	3.9	3.3	2.8	3.0
31	66		15		3.3	3.1	
Mean	21.1	74.4	25.0	7.1	3.5	2.5	2.6
Runoff in acre-feet	1,300	4,430	1,540	422	216	154	153

TABLE A-3

DAILY MEAN DISCHARGE OF WILLOW CREEK
NEAR ADIN

March through September 1963
(In second-feet)

Day	March	April	May	June	July	August	September
1	11	16	23	16	7.3	5.3	3.4
2	11	15	22	14	7.2	5.1	3.3
3	11	16	22	13	6.9	5.1	3.2
4	9.6	17	21	13	7.1	5.1	3.3
5	9.9	19	18	18	7.3	5.1	3.3
6	11	42	18	14	7.3	5.1	3.1
7	10	47	17	12	7.0	5.1	3.1
8	9.9	38	19	10	7.0	5.1	3.0
9	9.9	34	24	10	6.8	4.9	3.0
10	9.7	32	22	11	6.8	4.9	2.9
11	9.9	29	25	11	6.6	5.0	2.8
12	9.6	27	26	10	6.5	5.0	2.7
13	9.0	25	22	8.8	6.5	4.8	2.7
14	9.8	26	23	11	6.5	4.6	2.9
15	10	26	20	8.4	6.5	4.6	3.0
16	11	27	19	8.1	6.5	4.6	3.2
17	11	28	18	9.0	6.5	4.6	3.2
18	11	27	17	8.1	6.4	4.6	3.2
19	13	27	17	7.9	6.3	4.4	3.3
20	15	29	16	7.5	6.2	4.4	3.5
21	14	26	16	8.0	6.1	4.4	3.7
22	13	25	18	8.1	6.1	4.1	3.7
23	12	27	19	8.6	6.0	4.0	4.0
24	11	26	15	7.6	5.9	4.1	4.0
25	11	26	14	7.2	5.8	3.9	4.0
26	11	28	13	7.1	5.7	3.8	4.0
27	12	27	13	7.1	5.7	3.7	4.1
28	17	25	13	7.0	5.6	3.7	4.3
29	16	24	16	7.5	5.5	3.7	4.4
30	16	23	16	7.3	5.5	3.7	4.5
31	16		25		5.6	3.5	
Mean	11.7	26.8	18.9	9.9	6.4	4.5	3.4
Runoff in acre-feet	717	1,595	1,164	588	394	278	204

TABLE A-4

DAILY MEAN DISCHARGE OF PIT RIVER
NEAR CANBY

April through September 1963
(In second-feet)

Day	April	May	June	July	August	September
1	475	1,250	525	146	13	76
2	540	1,180	495	155	13	64
3	510	1,130	430	166	12	55
4	460	1,090	430	190	33	76
5	430	1,070	346	149	39	68
6	910	1,060	206	125	55	46
7	1,810	1,030	328	122	53	59
8	2,650	1,010	266	90	48	119
9	2,200	1,040	214	68	68	95
10	1,780	1,050	162	61	57	71
11	1,490	1,120	180	66	55	71
12	1,190	1,150	302	61	61	76
13	912	1,290	270	55	59	71
14	786	1,510	189	50	25	73
15	780	1,530	25	57	20	35
16	852	1,460	61	46	19	110
17	876	1,350	122	46	15	125
18	936	1,240	125	37	13	110
19	1,010	1,150	77	32	14	119
20	1,010	1,070	84	32	10	113
21	1,090	978	128	33	7.8	122
22	1,180	1,000	134	35	1.4	95
23	1,210	1,010	125	37	1.2	90
24	1,280	1,010	180	90	15	90
25	1,260	960	206	33	84	98
26	1,250	888	158	20	110	107
27	1,250	792	128	18	82	82
28	1,390	660	110	15	116	65
29	1,380	605	152	18	71	73
30	1,310	520	162	23	82	79
31		485		19	68	
Mean	1,140	1,054	211	67.6	42.6	84.4
Runoff in acre-feet	67,850	64,840	12,540	4,160	2,620	5,020

TABLE A-5

DAILY MEAN DISCHARGE OF PIT RIVER
NEAR BIEBER

March through September 1963
(In second-feet)

Day	March	April	May	June	July	August	September
1	614	2,020	1,940	679	65	2.0	1.4
2	550	2,030	1,820	661	254	1.6	3.2
3	505	1,810	1,780	614	161	1.4	4.1
4	465	1,600	1,750	530	100	1.5	4.1
5	432	1,400	1,690	495	106	1.3	3.8
6	410	2,250	1,630	470	222	1.2	3.8
7	392	4,750	1,550	305	166	0.9	3.2
8	374	7,220	1,510	283	179	0.8	3.5
9	357	7,000	1,620	228	174	0.8	2.3
10	332	5,680	1,740	254	114	0.8	1.5
11	305	4,560	1,770	165	76	0.8	3.8
12	283	3,740	1,790	81	64	0.7	5.0
13	265	3,060	1,750	64	22	0.7	5.6
14	261	2,530	1,740	99	12	0.6	5.9
15	275	2,260	1,810	106	14	0.6	15
16	290	2,300	1,900	184	17	0.8	12
17	324	2,290	1,870	187	43	0.8	11
18	349	2,260	1,780	182	42	0.7	11
19	357	2,250	1,670	100	39	0.7	15
20	382	2,380	1,540	114	23	0.7	16
21	442	2,500	1,410	142	16	0.8	18
22	505	2,640	1,260	258	15	0.8	19
23	500	2,520	1,240	182	10	0.8	20
24	465	2,340	1,250	168	8.3	0.8	24
25	442	2,210	1,240	108	8.3	0.8	14
26	392	2,170	1,200	114	7.1	1.3	8.0
27	349	2,130	1,130	137	6.8	1.1	10
28	776	2,080	1,060	91	6.2	1.2	15
29	1,810	2,040	938	49	5.6	1.2	18
30	1,930	2,020	857	40	3.8	1.1	15
31	1,830		789		1.8	1.1	
Mean	547	2,868	1,517	236	63.9	1.0	9.7
Runoff in acre-feet	33,650	170,700	93,270	14,060	3,930	60	580

TABLE A-6

RELEASES FROM ROBERTS RESERVOIR
(Cubic feet per second)

1963 Season

Day	June	July	August	September
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16			* 7.5	
17			25	
18			25	
19			7.5	
20			0	
21			0	
22			12	
23		*26	40	
24		40	40	
25		40	**15	
26		40		
27		40		
28		40		
29		**14		
30				
31				
Acre-feet		476	342	

Total Acre-feet = 818

* Reservoir opened
** Reservoir closed

TABLE A-7

DAILY MEAN DISCHARGE OF BURNEY CREEK
NEAR BURNEY

March through September 1963
(In second-feet)

Day	March	April	May	June	July	August	September
1	97	184	193	93	39	17	17
2	94	160	188	84	38	17	17
3	91	136	239	76	33	17	16
4	83	130	230	69	29	17	16
5	79	210	199	65	35	16	16
6	76	662	197	62	30	16	17
7	74	670	263	56	28	17	17
8	69	468	283	53	28	19	16
9	66	371	234	53	32	20	15
10	59	315	207	51	25	19	16
11	56	284	195	49	25	18	17
12	52	264	178	46	27	19	18
13	52	293	167	44	26	19	18
14	53	437	174	47	26	18	17
15	55	398	156	48	26	18	17
16	58	320	144	49	25	17	17
17	58	284	136	51	25	17	18
18	60	261	135	43	25	17	18
19	60	255	133	38	25	23	19
20	63	236	134	47	24	32	18
21	68	216	132	42	22	32	17
22	68	209	124	38	22	28	17
23	80	202	123	40	22	23	17
24	81	198	117	35	29	23	16
25	77	194	111	32	22	18	14
26	73	191	105	33	22	17	12
27	179	192	100	33	21	17	13
28	243	188	96	44	21	17	13
29	208	185	94	46	18	16	12
30	178	190	96	39	18	16	12
31	243		95		17	17	
Mean	92.0	277	161	50.2	26.0	19.3	16.1
Runoff in acre-feet	5,659	16,470	9,874	2,987	1,597	1,184	958

TABLE A-8

DAILY MEAN DISCHARGE OF BUTTE CREEK
NEAR CHICO

March through September 1963
(In second-feet)

Day	March	April	May	June	July	August	September
1	406	998	888	425	236	168	154
2	400	833	896	400	228	168	150
3	400	763	920	385	220	168	150
4	388	714	896	375	216	168	147
5	360	791	896	365	213	164	150
6	355	2,640	896	365	206	160	154
7	350	3,140	944	345	206	164	150
8	345	2,000	960	340	206	164	147
9	350	1,610	864	340	199	168	144
10	335	1,450	800	340	199	168	147
11	320	1,290	832	335	196	164	147
12	310	1,170	792	335	192	160	147
13	305	1,230	736	320	188	154	160
14	315	3,380	720	315	188	150	150
15	325	2,880	640	300	199	150	144
16	388	2,060	656	292	178	150	147
17	430	1,690	656	300	185	150	147
18	370	1,470	640	305	185	150	157
19	345	1,580	619	288	185	150	154
20	360	1,370	626	268	182	150	154
21	370	1,190	626	272	178	150	150
22	388	1,080	605	272	174	123	150
23	644	1,010	570	284	174	164	154
24	588	968	552	280	178	164	147
25	504	936	534	260	174	154	144
26	454	904	516	252	174	157	138
27	1,470	904	486	240	171	160	135
28	2,470	864	498	252	171	154	135
29	1,450	864	450	260	171	154	135
30	1,230	872	450	244	164	154	132
31	1,120		440		171	154	
Mean	576	1,422	697	312	191	157	147
Runoff in acre-feet	35,400	84,600	42,850	18,550	11,720	9,670	8,770

TABLE A-9

DAILY MEAN DISCHARGE OF BUTTE CREEK
NEAR DURHAM

March through September 1963
(In second-feet)

Day	March	April	May	June	July	August	September
1	321	1,070	872	144	47	25	27
2	331	896	853	137	44	29	27
3	344	782	858	129	39	27	27
4	343	713	867	136	40	26	27
5	307	749	869	131	34	27	25
6	287	2,670	869	134	34	26	24
7	289	3,250	903	118	32	28	25
8	294	2,250	899	120	27	28	28
9	312	1,780	793	130	26	31	24
10	293	1,600	728	158	25	30	23
11	254	1,410	742	157	23	30	22
12	235	1,250	708	154	21	28	22
13	235	1,320	648	139	21	27	24
14	266	3,420	637	128	21	28	27
15	302	3,000	511	115	22	28	23
16	554	2,160	508	86	23	28	21
17	617	1,740	489	98	21	28	23
18	441	1,480	484	113	23	28	27
19	347	1,610	420	99	22	28	27
20	350	1,400	404	89	23	28	28
21	352	1,220	421	75	23	27	28
22	360	1,080	370	110	23	26	33
23	740	1,000	330	182	23	27	48
24	711	966	314	131	23	32	53
25	522	938	278	69	24	27	50
26	393	903	254	62	25	26	49
27	1,290	905	218	60	23	29	53
28	3,010	854	229	68	26	27	53
29	1,760	851	158	90	26	28	51
30	1,400	860	183	61	25	28	50
31	1,210		171		26	28	
Mean	596	1,470	548	114	26.9	27.8	32.3
Runoff in acre-feet	36,640	87,530	33,700	6,790	1,660	1,710	1,920

TABLE A-10

DAILY MEAN DISCHARGE
OF DURHAM COLONY DITCH

May through September 1963
(In second-feet)

Day	May	June	July	August	September
1		53	64	51	48
2		51	62	51	48
3		46	62	51	48
4		46	61	51	50
5		52	56	51	48
6		48	55	49	49
7		49	56	51	49
8		52	56	51	49
9		53	56	51	47
10		56	55	53	47
11		55	53	53	47
12		56	53	52	48
13		56	53	51	48
14		56	53	51	47
15		56	54	50	46
16		56	56	51	43
17		56	52	52	42
18		57	52	52	44
19		57	52	51	43
20	46	58	52	52	43
21	47	60	51	51	46
22	48	29	51	50	46
23	52	8	51	51	47
24	52	41	51	51	48
25	52	59	51	50	48
26	51	59	51	48	47
27	50	57	51	49	47
28	51	57	51	48	
29	53	57	51	48	
30	54	59	51	47	
31	54		52	47	
Mean	50.8	51.8	54.0	50.5	46.8
Runoff in acre-feet	1,210	3,080	3,320	3,100	2,510

TABLE A-11

DAILY MEAN DISCHARGE OF DAYTON DITCH
AT EDGAR SLOUGH

April through September 1963
(In second-feet)

Day	April	May	June	July	August	September
1			26	26	17	17
2			26	26	17	18
3			25	25	18	18
4			25	25	18	17
5			25	25	18	17
6			25	25	18	16
7			25	24	18	16
8			25	25	18	16
9		29	25	26	18	17
10		29	25	25	17	17
11		28	25	25	17	17
12		28	25	25	17	17
13		27	25	25	17	17
14		27	25	25	17	17
15		19	25	19	17	17
16		19	25	19	17	17
17		19	25	19	17	16
18		19	25	18	17	16
19		29	24	18	18	16
20		29	23	18	18	16
21		29	23	18	18	14
22		29	25	18	17	12
23		29	25	18	17	15
24		29	25	18	17	17
25		28	25	18	17	17
26		29	24	18	17	18
27		29	25	18	17	17
28		28	26	18	17	
29		26	26	18	17	
30		25	26	18	17	
31		28		17	17	
Mean		26.6	25.0	21.3	17.3	16.5
Runoff in acre-feet		1,210	1,490	1,310	1,070	883

TABLE A-12

DAILY MEAN DISCHARGE
OF PARROTT DITCH

May through September 1963
(In second-feet)

Day	May	June	July	August	September
1		162	129	86	86
2		154	129	89	86
3		139	129	89	82
4		127	129	89	77
5		124	129	89	79
6		129	116	88	88
7		127	116	84	86
8		127	115	84	84
9	72	126	112	84	82
10	84	112	112	84	80
11	92	109	111	80	80
12	90	109	111	79	81
13	89	122	106	79	84
14	88	124	104	80	81
15	88	124	104	81	79
16	84	124	101	81	81
17	84	126	94	81	80
18	84	139	94	79	85
19	97	132	93	77	85
20	119	128	93	77	85
21	129	131	92	80	84
22	137	132	92	80	76
23	139	142	92	80	60
24	139	139	91	82	44
25	144	129	91	83	44
26	149	129	90	86	44
27	149	130	89	87	44
28	149	131	89	86	
29	144	134	89	86	
30	147	132	88	86	
31	155		88	86	
Mean	115	130	104	83.3	75.8
Runoff in acre-feet	5,260	7,720	6,380	5,120	4,060

TABLE A-13

DAILY MEAN DISCHARGE OF TOADTOWN CANAL
ABOVE BUTTE CANAL

April through September 1963
(In second-feet)

Day	April	May	June	July	August	September
1	117	117	124	89	71	67
2	115	117	119	86	72	67
3	114	117	111	83	71	68
4	114	117	107	79	71	67
5	118	118	104	76	71	69
6	110	123	103	74	66	67
7	116	124	104	73	71	67
8	121	123	114	73	72	67
9	122	121	118	73	71	67
10	121	118	118	73	70	66
11	120	118	118	73	69	67
12	119	118	118	73	67	65
13	128	118	115	73	66	69
14	126	118	113	74	66	67
15	122	120	110	73	65	66
16	118	119	107	73	68	67
17	121	119	113	74	69	68
18	123	119	117	74	69	67
19	123	118	113	74	69	64
20	120	120	108	73	68	65
21	118	127	106	72	68	63
22	117	127	106	71	65	63
23	117	127	110	74	72	64
24	116	127	106	74	72	60
25	116	127	98	74	69	60
26	113	124	94	73	72	58
27	113	123	89	72	72	58
28	111	124	95	72	71	58
29	114	124	95	71	69	58
30	116	124	92	71	68	58
31		125		71	67	
Mean	118	121	108	74.3	69.3	64.5
Runoff in acre-feet	7,020	7,120	6,440	4,570	4,270	3,840

TABLE A-14

DAILY MEAN DISCHARGE
OF MILLVILLE DITCH-CLOVER CREEK

June through September 1963
(In second-feet)

Day	June	July	August	September
1		7.4	7.4	6.4
2		8.0	7.4	6.4
3		8.0	7.4	6.2
4		8.0	7.4	6.2
5		7.8	7.4	6.2
6	7.5	7.6	7.4	6.1
7	7.5	7.4	7.4	6.1
8	7.5	7.4	7.4	6.1
9	7.4	7.4	7.4	6.1
10	7.3	7.4	7.4	6.0
11	7.3	7.4	7.4	6.0
12	7.5	7.4	7.4	6.0
13	7.5	7.4	7.4	6.0
14	7.5	7.4	7.3	6.0
15	7.5	7.4	7.2	6.0
16	7.5	7.4	7.0	
17	7.5	7.4	6.9	
18	7.5	7.4	7.2	
19	7.4	7.4	7.4	
20	7.4	7.4	6.8	
21	7.4	7.4	6.8	
22	7.4	7.4	6.8	
23	7.4	7.4	6.8	
24	7.4	7.4	6.8	
25	7.4	7.4	6.7	
26	7.4	7.4	6.7	
27	7.4	7.4	6.6	
28	7.4	7.2	6.6	
29	7.4	7.2	6.6	
30	7.4	7.3	6.5	
31		7.3	6.5	
Mean	7.4	7.5	7.1	6.1
Runoff in acre-feet	369	459	435	182

TABLE A-15

DAILY MEAN DISCHARGE OF COOK AND BUTCHER DITCH
FROM LITTLE COW CREEK

April through September 1963
(In second-feet)

Day	April	May	June	July	August	September
1			2.0	8.1	6.2	4.1
2			2.0	6.2	5.7	7.1
3			2.0	3.8	5.4	7.2
4			2.9	3.8	4.1	4.5
5			3.8	8.1	4.5	4.5
6			6.6	8.1	3.1	4.5
7			5.7	*	5.4	5.0
8			5.0	*	6.2	5.0
9			4.2	6.9	6.0	4.5
10			3.8	7.2	5.8	4.5
11			7.2	7.2	5.8	4.5
12			*	5.4	5.8	5.4
13			*	3.8	6.2	6.2
14			*	5.4	5.4	6.2
15			*	5.4	4.5	5.7
16			*	8.1	5.0	6.2
17			*	*	4.5	6.8
18			8.1	*	4.1	
19			7.2	*	4.2	
20			5.0	*	4.2	
21			5.0	*	4.5	
22			6.2	9.1	4.6	
23			*	8.1	5.0	
24			8.1	9.1	5.0	
25			6.8	7.2	5.2	
26			5.0	6.2	5.2	
27		2.4	3.8	3.8	5.9	
28		2.2	*	5.7	4.5	
29		2.0	*	7.2	4.4	
30		2.0	*	7.2	4.2	
31		2.0		8.1	3.6	
Mean		2.1			5.0	5.4
Runoff in acre-feet		21			306	181

* Parshall Flume under submerged conditions. Discharge estimated over 10 cfs

TABLE A-16

DAILY MEAN DISCHARGE OF LITTLE COW CREEK NEAR INGOT

March through September 1963
(In second-feet)

Day	March	April	May	June	July	August	September
1	96	396	240	88	30	14	11
2	92	275	232	79	30	14	10
3	89	225	286	76	30	13	9.2
4	88	197	262	74	30	13	9.3
5	84	1,120	247	71	30	13	9.1
6	84	5,090	234	68	29	12	8.9
7	82	3,560	507	64	30	12	9.3
8	80	1,120	442	62	29	12	9.4
9	77	824	373	57	27	13	9.3
10	74	781	307	55	25	14	9.3
11	72	613	288	53	25	13	9.1
12	69	506	251	51	24	12	8.9
13	67	534	229	50	24	11	9.1
14	74	1,280	214	46	23	11	9.4
15	72	836	199	45	22	11	9.4
16	88	583	190	44	20	10	9.6
17	94	468	183	43	20	10	10
18	96	482	179	40	20	11	11
19	99	866	172	38	19	10	11
20	95	476	169	36	19	9.4	11
21	83	382	163	37	18	9.9	11
22	78	363	155	38	18	11	11
23	190	305	148	39	17	12	11
24	192	282	141	35	17	14	11
25	113	275	131	34	16	13	11
26	99	274	124	33	14	12	11
27	634	273	116	32	14	11	11
28	652	242	106	38	13	11	11
29	295	235	103	36	14	11	11
30	297	238	98	32	14	11	10
31	840		94		14	11	
Mean	166	770	212	49.8	21.8	11.8	10.1
Runoff in acre-feet	10,210	45,820	13,060	2,960	1,340	725	600

TABLE A-17

DAILY MEAN DISCHARGE OF
OAK RUN CREEK NEAR OAK RUN

March through September 1963
(In second-feet)

Day	March	April	May	June	July	August	September
1	11	56	20	10	4.7	3.4	3.8
2	11	38	19	9.5	5.3	4.0	3.4
3	11	33	22	8.8	5.9	3.9	3.0
4	10	28	20	8.8	6.5	3.6	3.6
5	10	176	18	8.6	6.0	3.9	3.8
6	10	481	18	8.3	5.8	2.6	4.6
7	9.9	300	44	8.6	5.4	3.0	4.4
8	9.7	200	39	8.1	5.2	3.0	3.3
9	9.5	150	32	7.6	5.2	3.8	4.2
10	9.3	100	39	7.2	5.2	3.8	3.4
11	9.0	95	33	6.7	3.9	3.9	3.8
12	8.8	80	27	6.5	3.6	3.0	2.7
13	8.6	70	24	7.0	3.6	2.6	4.2
14	9.9	200	22	7.3	4.0	2.7	4.8
15	9.3	150	20	7.0	3.9	2.7	4.4
16	14	90	19	6.2	3.0	3.4	4.7
17	16	59	18	3.6	4.0	3.7	5.2
18	12	64	18	3.5	3.7	3.7	5.2
19	11	120	16	3.9	4.3	4.3	5.3
20	10	57	15	4.7	3.4	4.0	5.3
21	9.9	47	15	5.3	3.3	4.0	5.8
22	9.9	45	14	6.4	3.4	3.8	4.8
23	34	36	14	6.5	3.8	4.0	4.8
24	21	33	14	5.9	4.8	4.6	5.0
25	14	35	13	5.6	4.6	3.6	4.8
26	12	33	9.5	5.4	3.0	3.8	4.8
27	82	30	9.5	5.4	3.2	2.7	3.0
28	73	27	10	5.9	2.8	3.4	3.8
29	31	24	10	5.8	2.9	3.8	4.2
30	35	22	10	5.8	3.7	4.6	5.4
31	135		10		3.7	4.2	
Mean	21.5	96.0	19.7	6.7	4.3	3.6	4.3
Runoff in acre-feet	1,320	5,710	1,210	396	261	221	257

TABLE A-18

DAILY MEAN DISCHARGE OF HAT CREEK
NEAR HAT CREEK

April through September 1963
(In second-feet)

Day	April	May	June	July	August	September
1	118	158	223	153	139	122
2	116	162	218	153	139	122
3	120	187	207	150	139	126
4	122	182	200	146	139	122
5	130	190	207	141	139	120
6	218	195	202	141	139	122
7	182	207	200	141	139	126
8	155	207	200	144	141	130
9	146	182	202	146	133	130
10	144	175	202	146	128	130
11	139	167	190	148	122	130
12	137	162	182	150	120	133
13	139	162	192	148	120	133
14	175	167	202	148	122	133
15	162	175	195	148	124	133
16	150	187	200	146	128	135
17	144	200	195	146	135	135
18	141	207	195	146	137	135
19	141	213	192	146	137	137
20	141	223	195	137	139	135
21	141	234	195	130	139	133
22	141	228	190	130	137	133
23	141	218	185	130	137	133
24	141	218	180	130	135	128
25	141	218	177	128	137	124
26	139	218	175	128	137	122
27	139	220	175	126	135	126
28	141	223	177	126	135	133
29	146	234	170	133	126	130
30	150	228	158	139	122	130
31		237		139	122	
Mean	145	199	193	141	133	129
Runoff in acre-feet	8,610	12,270	11,470	8,650	8,170	7,700

TABLE A-19

DAILY MEAN DISCHARGE OF INDIAN CREEK
NEAR TAYLORSVILLE

March through September 1963
(In second-feet)

Day	March	April	May	June	July	August	September
1	387	788	1,780	605	216	43	50
2	377	670	1,810	544	193	42	50
3	355	674	1,870	478	183	39	50
4	424	714	1,800	436	182	48	41
5	424	835	1,800	417	179	44	41
6	424	3,310	1,830	437	167	55	41
7	424	5,060	1,730	361	151	54	45
8	424	3,160	1,660	337	149	54	41
9	424	2,290	1,760	316	130	60	38
10	424	1,830	1,420	368	124	64	33
11	424	1,650	1,330	394	117	64	34
12	424	1,540	1,220	347	118	58	46
13	424	1,340	1,080	331	115	55	72
14	424	1,720	1,050	317	109	49	60
15	424	2,030	1,010	271	106	52	53
16	424	1,770	1,010	255	109	40	54
17	424	1,610	1,040	267	100	37	54
18	424	1,430	1,060	253	92	42	48
19	424	1,320	1,080	233	87	46	51
20	424	1,140	1,090	218	95	30	53
21	424	1,130	1,060	209	97	45	53
22	424	1,070	1,010	233	105	42	48
23	424	1,210	998	324	103	39	48
24	424	1,510	1,050	337	92	35	46
25	347	1,660	896	260	76	38	46
26	355	1,350	809	226	71	45	44
27	421	1,290	756	216	60	46	44
28	997	1,500	683	229	61	44	42
29	966	1,630	708	229	64	40	43
30	855	1,700	691	223	51	46	39
31	840		685		41	47	
Mean	478	1,631	1,219	322	114	46.5	46.9
Runoff in acre-feet	29,360	97,050	74,930	19,180	7,030	2,860	2,790

TABLE A-20

DAILY MEAN DISCHARGE OF LITTLE LAST CHANCE CREEK
NEAR CHILCOOT

March through September 1963
(In second-feet)

Day	March	April	May	June	July	August	September
1	2.8	4.0	5.5	88	1.2	8.1	18
2	3.0	4.0	5.2	101	1.2	32	13
3	3.0	4.0	5.0	98	1.3	74	8.2
4	3.0	4.0	4.6	111	1.3	82	7.5
5	3.0	4.2	4.7	115	1.3	91	6.4
6	3.0	9.9	4.4	123	1.7	98	5.5
7	3.0	14	4.2	114	3.9	105	1.2
8	3.0	12	4.6	104	3.8	111	1.0
9	3.0	8.9	4.5	80	3.8	110	1.0
10	3.0	7.6	4.4	51	3.9	107	1.1
11	3.5	6.6	4.1	32	4.0	106	1.3
12	3.5	6.2	4.2	31	8.6	106	1.6
13	3.5	5.5	4.2	31	12	106	1.6
14	3.5	5.6	4.1	31	13	102	1.5
15	3.5	5.7	3.9	31	13	107	1.5
16	3.5	5.6	3.9	31	13	109	1.2
17	3.5	5.4	3.6	32	13	111	1.4
18	3.5	5.4	3.7	32	14	112	1.7
19	3.5	6.3	3.6	25	14	101	2.1
20	3.5	6.3	4.1	13	14	91	1.8
21	4.0	6.2	3.3	11	14	75	1.7
22	4.0	7.1	3.2	9.8	14	69	1.7
23	4.0	8.3	3.3	10	14	69	1.7
24	4.0	8.7	3.3	10	11	69	1.6
25	4.0	8.3	3.2	10	8.1	68	1.8
26	4.0	7.6	3.2	3.5	8.1	66	1.4
27	4.0	7.0	31	1.3	8.5	65	1.5
28	4.0	6.8	51	1.2	8.3	65	1.5
29	4.0	6.6	68	1.3	8.1	65	1.4
30	4.0	6.1	89	1.3	8.1	38	1.6
31	4.0		91		8.1	18	
Mean	3.5	6.8	14.1	44.4	8.1	81.8	3.2
Runoff in acre-feet	216	404	865	2,640	500	5,030	187

TABLE A-21

DAILY MEAN DISCHARGE OF LITTLE TRUCKEE DITCH
AT HEAD

April through September 1963
(In second-feet)

Day	April	May	June	July	August	September
1				14	11	3.4
2				15	11	3.4
3				21	10	3.4
4				24	9.8	3.4
5				34	9.5	3.4
6				45	9.2	3.4
7				45	8.6	3.6
8				44	8.2	3.6
9				43	7.9	3.4
10			16	43	7.6	3.4
11			16	45	7.1	3.4
12			16	45	6.8	4.4
13			16	47	6.2	5.1
14			17	50	5.9	4.9
15			18	46	5.7	4.6
16			17	40	5.4	4.4
17			17	35	5.1	4.1
18			16	33	4.9	4.1
19			14	29	4.6	3.9
20			13	27	4.4	3.6
21			12	25	4.1	3.6
22			11	22	4.1	3.6
23			11	21	3.9	3.4
24			10	19	3.9	3.4
25			9.5	18	3.9	3.4
26			9.5	17	3.9	3.4
27			14	15	3.9	3.4
28			18	14	3.6	3.4
29			16	14	3.6	3.4
30			15	13	3.6	3.4
31				12	3.6	
Mean			14.4	30	6.2	3.7
Runoff in acre-feet			599	1,810	379	220

TABLE A-22

DAILY MEAN DISCHARGE OF MIDDLE FORK FEATHER RIVER
NEAR PORTOLA

March through September 1963
(In second-feet)

Day	March	April	May	June	July	August	September
1	163	500	637	201	44	0.9	0.8
2	152	400	624	220	45	0.5	1.1
3	140	373	624	209	65	0.4	0.6
4	127	411	613	202	61	0.6	0.7
5	115	467	609	218	43	0.6	1.1
6	135	1,150	591	209	32	0.7	1.2
7	151	1,890	549	176	29	0.5	1.1
8	151	2,800	560	162	22	0.7	1.1
9	154	2,170	613	152	17	1.3	1.1
10	141	1,400	624	185	15	1.0	0.7
11	127	1,050	647	167	12	0.8	0.6
12	116	935	581	152	11	0.6	0.9
13	99	781	535	136	10	1.2	1.6
14	95	787	476	128	9.9	1.5	0.8
15	94	764	425	120	8.3	1.3	0.9
16	105	916	371	114	7.3	1.0	1.0
17	128	1,090	328	107	6.1	1.2	1.0
18	133	982	296	106	5.6	1.5	1.4
19	134	872	277	99	5.8	1.3	3.7
20	144	824	246	93	5.1	1.3	2.3
21	157	1,140	170	95	5.2	1.0	2.3
22	162	1,150	204	97	4.0	1.2	3.8
23	170	1,120	222	99	3.2	1.2	3.7
24	178	1,020	240	88	2.4	1.0	3.3
25	191	830	214	72	2.6	1.0	2.1
26	204	679	220	68	3.5	1.3	0.9
27	210	664	216	61	3.4	1.2	1.3
28	210	713	214	56	3.8	1.2	0.8
29	500	652	234	49	2.5	1.1	0.6
30	600	629	206	48	2.0	0.9	1.2
31	500		205		1.0	1.2	
Mean	183	972	406	130	15.7	1.0	1.5
Runoff in acre-feet	11,280	57,840	24,930	7,710	967	62	87

TABLE A-23

DAILY MEAN DISCHARGE OF SMITHNECK CREEK
NEAR LOYALTON

March through September 1963
(In second-feet)

Day	March	April	May	June	July	August	September
1	11	32	52	44	8.0	5.4	4.8
2	11	33	61	39	8.0	5.5	4.7
3	11	35	62	38	8.6	5.5	4.7
4	11	38	68	34	7.8	5.6	4.7
5	11	42	67	38	7.9	5.7	4.9
6	11	69	60	33	8.1	5.3	4.8
7	10	98	46	28	8.1	5.0	4.7
8	11	67	50	25	7.8	5.4	4.7
9	10	51	49	21	7.3	5.4	4.8
10	9.3	59	41	28	7.4	5.4	4.7
11	9.2	36	40	21	7.1	5.1	4.6
12	8.6	35	38	17	7.0	4.9	5.0
13	8.3	36	35	16	6.7	4.8	5.1
14	8.9	35	34	18	6.8	4.9	4.7
15	9.4	39	37	17	6.4	4.9	4.6
16	9.7	46	37	15	6.3	4.9	4.5
17	10	45	40	16	6.2	4.9	4.8
18	10	45	41	13	6.6	5.0	4.9
19	9.8	46	41	12	6.3	4.9	5.2
20	12	48	41	12	6.3	4.8	5.0
21	13	48	37	11	6.3	5.0	4.5
22	13	46	39	12	6.1	4.9	4.3
23	14	44	40	12	6.1	4.9	4.3
24	14	42	42	12	6.0	5.0	4.1
25	15	37	38	10	5.9	4.9	4.3
26	17	38	37	9.1	5.9	5.1	4.4
27	22	39	33	8.7	5.8	4.9	4.2
28	27	39	43	8.8	5.9	4.6	4.5
29	29	41	56	9.8	6.0	4.7	4.1
30	29	42	48	8.8	6.0	4.9	4.1
31	31		44		5.6	4.9	
Mean	13.7	45.0	45.1	19.6	6.8	5.1	4.6
Runoff in acre-feet	845	2,680	2,770	1,160	417	312	275

TABLE A-24

DAILY MEAN DISCHARGE OF MILLER CREEK
NEAR SATTLEY

March through September 1963
(In second-feet)

Day	March	April	May	June	July	August	September
1	12	9.5	23	44	23	11	6.7
2	11	9.1	24	44	22	11	6.7
3	11	10	26	40	22	11	6.4
4	11	11	28	40	21	11	6.4
5	11	13	37	39	20	10	6.8
6	11	28	35	38	20	10	6.9
7	11	26	35	37	20	9.7	6.7
8	11	17	32	37	20	9.8	6.7
9	11	15	28	37	19	10	6.6
10	11	13	25	39	18	9.7	6.1
11	10	13	22	34	17	9.7	6.0
12	10	13	23	35	16	9.6	8.9
13	10	14	23	34	16	9.3	7.6
14	9.6	19	25	37	15	9.2	6.5
15	11	15	27	34	15	8.9	6.2
16	11	14	31	41	15	8.8	6.1
17	10	13	34	38	15	8.7	6.2
18	9.7	13	36	36	15	7.9	6.4
19	9.8	12	39	34	14	7.8	8.0
20	10	13	41	32	14	7.7	7.1
21	9.9	12	45	31	14	7.7	6.7
22	10	12	42	31	13	7.4	6.4
23	10	12	43	31	13	7.4	6.2
24	10	12	44	29	13	7.2	6.0
25	9.8	12	43	28	13	7.3	5.9
26	9.9	11	41	27	13	7.1	5.8
27	11	11	43	25	12	6.9	5.4
28	11	14	57	25	12	6.9	5.5
29	11	17	56	25	12	7.0	5.4
30	10	21	49	24	12	6.8	5.4
31	9.6		45		11	6.7	
Mean	10.5	14.2	35.5	34.2	16.0	8.7	6.5
Runoff in acre-feet	643	842	2,190	2,040	982	534	384

TABLE A-25

DAILY MEAN DISCHARGE OF NORTH FORK COTTONWOOD CREEK NEAR IGO

March through September 1963
(In second-feet)

Day	March	April	May	June	July	August	September
1	118	490	446	115	41	26	17
2	117	398	433	111	39	25	17
3	117	396	357	108	41	25	16
4	115	351	286	112	40	24	16
5	111	730	272	112	40	25	16
6	113	935	253	113	39	25	17
7	116	797	297	112	38	25	18
8	118	871	334	88	38	25	17
9	120	847	285	85	37	25	17
10	116	957	351	76	38	24	17
11	110	739	323	61	37	23	17
12	113	691	277	59	40	23	17
13	117	963	248	55	38	22	19
14	117	1,580	232	54	38	19	18
15	112	1,320	216	55	36	18	18
16	144	1,100	203	66	34	18	17
17	129	958	194	63	34	17	17
18	123	1,000	185	58	33	17	17
19	120	1,010	178	58	33	17	17
20	118	856	174	56	32	17	18
21	114	759	178	48	32	17	17
22	122	699	168	49	31	16	17
23	230	608	160	48	32	16	17
24	156	557	153	46	32	18	17
25	142	705	142	46	30	17	16
26	139	608	136	44	28	16	16
27	1,070	518	128	43	28	16	16
28	783	489	123	44	28	17	12
29	708	461	123	43	28	17	11
30	723	458	121	42	26	17	9.9
31	619		120		26	17	
Mean	231	762	229	69.0	34.4	20.1	16.4
Runoff in acre-feet	14,220	45,320	14,080	4,110	2,120	1,240	976

TABLE A-26

DAILY MEAN DISCHARGE OF NEW PINE CREEK
BELOW SCHROEDER'S

April through September 1963
(In second-feet)

Day	April	May	June	July	August	September
1		62	62	24	9.5	7.5
2		58	56	24	9.5	7.5
3		64	56	23	9.5	7.5
4		61	52	23	9.2	7.5
5		72	51	21	9.2	7.2
6		84	50	20	8.8	7.2
7		94	49	19	8.8	7.2
8		94	49	19	8.8	7.2
9		86	46	19	8.2	6.8
10		62	48	18	8.2	6.8
11		66	46	18	8.2	6.8
12		64	46	17	8.0	6.8
13		72	46	18	8.0	6.8
14		76	46	18	8.0	6.8
15		112	44	16	8.0	6.8
16		116	42	16	8.0	6.8
17		103	39	17	8.0	6.8
18		103	32	16	8.0	6.8
19		125	28	16	8.0	6.8
20		122	30	14	8.0	6.8
21		94	32	14	8.0	6.8
22		92	32	12	8.0	6.8
23		88	30	12	8.0	6.8
24	22	88	28	12	7.5	
25	29	78	27	12	7.5	
26	29	72	26	12	7.5	
27	31	67	24	12	7.5	
28	38	67	25	11	7.5	
29	54	62	25	10	7.5	
30	66	56	25	10	7.5	
31		57		10	7.5	
Mean	38.4	81.2	39.7	16.3	8.2	7.0
Runoff in acre-feet	534	4,990	2,360	1,000	504	319

TABLE A-27

DAILY MEAN DISCHARGE OF COTTONWOOD CREEK
BELOW LARKIN GARDEN DITCH

April through September 1963
(In second-feet)

Day	April	May	June	July	August	September
1		12	14	7.4	0.7	0.4
2		10	13	6.9	0.7	0.4
3		9.9	11	6.3	0.7	0.4
4		10	9.9	6.3	0.7	0.4
5		10	9.9	4.4	0.7	0.4
6		10	9.2	3.9	0.7	0.4
7		11	9.2	3.0	0.6	0.4
8		9.9	8.9	2.5	0.6	0.4
9		9.2	8.9	2.3	0.6	0.3
10		9.0	8.9	2.2	0.6	0.3
11		9.5	8.9	2.2	0.6	0.3
12		10	9.5	2.0	0.6	0.4
13		16	9.5	1.8	0.6	0.4
14		18	9.4	1.8	0.6	0.4
15		33	9.5	1.7	0.5	0.4
16		44	10	1.7	0.5	0.4
17		38	9.5	1.7	0.5	0.4
18		38	7.4	1.7	0.5	0.4
19		36	6.6	1.7	0.5	0.4
20		40	6.0	1.5	0.5	0.4
21		34	6.6	1.4	0.5	
22		38	7.4	1.2	0.5	
23		34	6.6	1.0	0.4	
24		25	6.3	1.0	0.4	
25		22	5.6	0.9	0.4	
26		19	4.4	0.9	0.4	
27	3.0	17	5.6	0.9	0.4	
28	7.0	17	7.4	0.9	0.4	
29	9.0	15	8.2	0.9	0.4	
30	11	15	7.6	0.8	0.4	
31		15		0.8	0.4	
Mean	7.4	20.5	8.6	2.5	0.5	0.4
Runoff in acre-feet	59	1,260	511	146	33	15

TABLE A-28

DAILY MEAN DISCHARGE OF DAVIS CREEK
AT OLD FISH WHEEL

April through September 1963
(In second-feet)

Day	April	May	June	July	August	September
1		42	63	16	8.3	4.6
2		43	57	16	8.3	4.6
3		49	52	16	7.5	4.5
4		48	46	15	7.5	4.2
5		52	46	15	7.5	4.2
6		56	46	14	7.5	4.5
7		56	42	14	7.1	4.5
8		56	40	12	7.1	4.5
9		56	36	12	7.1	4.6
10		56	33	12	7.1	4.6
11		56	28	12	6.0	4.6
12		60	26	11	5.5	5.0
13		56	25	11	5.5	5.0
14		53	24	10	5.2	4.5
15		60	24	10	5.2	3.8
16		64	22	10	5.2	4.2
17		66	22	10	5.2	3.8
18		67	22	10	5.2	3.5
19		69	20	10	5.0	3.8
20		70	20	10	5.0	3.8
21		74	20	9.5	5.0	
22		74	22	9.2	5.0	
23		72	21	9.0	5.0	
24		72	19	9.0	4.8	
25		72	18	8.6	4.8	
26		72	18	8.6	4.8	
27		72	18	8.6	4.8	
28		72	18	8.3	4.6	
29	40	77	18	8.3	4.6	
30	40	69	18	8.3	4.6	
31		72		8.3	4.6	
Mean	40.0	62.4	29.4	11.1	5.6	4.3
Runoff in acre-feet	160	3,840	1,750	679	358	172

TABLE A-29

DAILY MEAN DISCHARGE OF LINVILLE CREEK
AT OLD POWER HOUSE

April through September 1963
(In second-feet)

Day	April	May	June	July	August	September
1			3.4	2.1	2.1	2.1
2			3.3	2.1	2.1	2.1
3			3.2	2.1	2.1	2.1
4			3.2	2.1	2.0	2.1
5			3.0	2.1	2.0	2.1
6			2.9	2.1	2.0	2.1
7			2.8	2.1	2.0	2.1
8			2.7	2.1	2.0	2.1
9			2.7	2.1	2.0	2.0
10			2.6	2.1	2.1	2.0
11			2.6	2.1	2.1	2.0
12			2.5	2.1	2.1	2.0
13			2.5	2.1	2.1	2.0
14			2.5	2.0	2.1	2.0
15			2.4	2.0	2.1	2.0
16			2.3	2.0	2.1	2.0
17		4.5	2.1	2.0	2.1	2.0
18		4.6	2.0	2.1	2.1	2.0
19		4.9	1.9	2.1	2.1	2.0
20		5.2	1.9	2.1	2.1	2.0
21		5.1	1.9	2.1	2.1	2.0
22		4.7	2.0	2.1	2.1	
23		4.2	2.0	2.1	2.1	
24		3.9	2.1	2.1	2.1	
25		3.7	2.1	2.1	2.1	
26		3.4	2.1	2.1	2.1	
27		3.4	2.1	2.1	2.1	
28		3.4	2.1	2.1	2.1	
29		3.5	2.1	2.1	2.1	
30		3.6	2.1	2.1	2.1	
31		3.5		2.1	2.1	
Mean		4.1	2.4	2.1	2.1	2.0
Runoff in acre-feet		122	145	128	128	85

TABLE A-30

DAILY MEAN DISCHARGE OF FRANKLIN CREEK
ABOVE DIVERSIONS

April through September 1963
(In second-feet)

Day	April	May	June	July	August	September
1		18	11	4.1	2.5	2.2
2		17	10	3.8	2.5	2.2
3		18	11	3.6	2.6	2.1
4		18	11	3.4	2.5	2.1
5		20	10	3.3	2.4	2.1
6		19	9.3	3.3	2.4	2.1
7		18	8.8	3.3	2.4	2.1
8		16	8.5	3.2	2.4	2.2
9		16	8.5	3.1	2.3	2.2
10		14	8.8	2.8	2.3	2.2
11		13	8.3	2.8	2.3	2.2
12		13	8.0	2.7	2.3	2.2
13		15	7.5	2.7	2.3	2.6
14		16	7.2	2.7	2.2	2.5
15		18	7.1	2.7	2.2	2.5
16		20	6.8	2.6	2.2	2.3
17		22	6.5	2.7	2.2	2.2
18		22	6.3	2.7	2.2	2.2
19		26	6.0	2.7	2.2	2.2
20		28	5.7	2.7	2.2	2.3
21		27	5.7	2.6	2.2	2.3
22		26	6.3	2.6	2.2	2.2
23		24	6.0	2.6	2.2	
24		21	5.7	2.6	2.2	
25		19	5.6	2.6	2.2	
26		18	5.4	2.5	2.2	
27		16	5.1	2.4	2.1	
28		14	4.9	2.4	2.0	
29	14	14	4.6	2.4	2.1	
30	16	13	4.3	2.5	2.1	
31		14		2.5	2.1	
Mean	14.5	18.4	7.4	2.9	2.3	2.2
Runoff in acre-feet	58	1,130	437	176	139	98

TABLE A-31

DAILY MEAN DISCHARGE OF JOSEPH CREEK
BELOW COUCH CREEK

April through September 1963
(In second-feet)

Day	April	May	June	July	August	September
1		60	21	6.1	1.4	1.0
2		54	15	6.1	1.4	1.0
3		56	24	5.9	1.4	0.9
4		48	18	5.9	1.4	1.1
5		42	17	5.2	1.3	1.4
6		44	13	4.6	1.3	1.5
7		46	10	4.2	1.3	1.4
8		42	9.7	4.2	1.4	1.4
9		42	9.0	4.2	1.3	1.4
10		32	9.2	3.7	1.2	1.4
11		29	7.0	3.5	1.2	1.2
12		42	7.0	3.2	1.2	1.7
13		53	8.0	3.2	1.0	1.8
14		44	8.7	3.0	1.0	1.7
15		52	8.5	2.8	0.9	1.8
16		57	8.2	2.8	0.9	1.8
17		67	7.7	2.9	0.9	1.8
18		69	7.2	2.9	0.9	1.8
19		76	7.0	2.8	0.9	1.8
20		80	7.2	2.2	1.2	1.8
21		78	7.7	1.8	1.5	1.8
22		68	10	2.2	1.5	1.8
23		57	8.8	2.5	1.5	1.8
24		56	8.2	2.5	1.5	1.8
25	26	48	7.5	2.4	1.5	1.8
26	21	43	6.9	2.2	1.5	
27	28	41	6.7	2.1	1.5	
28	37	36	7.7	1.8	1.4	
29	48	34	8.0	1.8	1.1	
30	56	32	7.0	1.4	1.1	
31		28		1.4	1.1	
Mean	36.0	50.2	10.1	3.2	1.2	1.5
Runoff in acre-feet	429	3,090	598	201	77	77

TABLE A-32

DAILY MEAN DISCHARGE OF NORTH FORK PIT RIVER
BELOW THOMS CREEK

April through September 1963
(In second-feet)

Day	April	May	June	July	August	September
1		190	100	12	4.8	1.5
2		180	77	10	4.8	1.5
3		210	110	8.5	4.5	2.5
4		205	98	8.0	4.3	2.5
5		189	77	5.7	4.3	2.5
6		183	75	4.8	4.3	2.5
7		181	72	4.8	4.3	2.5
8		180	62	4.5	4.5	2.1
9		177	50	4.5	4.5	1.9
10		205	46	4.2	4.5	1.9
11		325	40	4.0	4.5	1.3
12		410	35	3.8	4.5	1.8
13		315	26	3.7	4.8	2.1
14		230	22	3.7	4.5	2.5
15		230	18	3.3	4.5	1.9
16		230	18	3.2	4.5	1.7
17		227	16	3.2	4.3	1.7
18		220	14	3.0	4.3	1.8
19		220	12	3.0	4.3	2.0
20		215	11	2.6	4.3	2.1
21		210	12	2.6	4.3	2.5
22		200	24	2.5	4.3	
23		185	21	2.5	4.3	
24		166	18	3.3	2.6	
25		149	14	4.5	1.2	
26		130	10	4.5	1.2	
27		120	8.5	5.2	1.2	
28		105	13	5.2	1.2	
29	200	105	18	5.2	1.3	
30	200	103	17	5.2	1.5	
31		103		5.2	1.5	
Mean	200.0	197.0	37.8	4.8	3.7	2.0
Runoff in acre-feet	793	12,100	2,250	291	226	85

TABLE A-33

DAILY MEAN DISCHARGE OF THOMS CREEK
AT CEDARVILLE-ALTURAS HIGHWAY

April through September 1963
(In second-feet)

Day	April	May	June	July	August	September
1		66	23	4.4	0.7	0.3
2		66	20	4.2	0.7	0.2
3		66	22	4.2	0.7	0.2
4		77	19	3.9	0.6	0.2
5		79	17	3.8	0.6	0.2
6		72	15	3.5	0.6	0.2
7		66	14	3.2	0.6	0.1
8		66	13	2.9	0.6	0.1
9		66	12	2.6	0.6	0.1
10		77	13	2.5	0.6	0.1
11		94	11	2.4	0.5	0.1
12		100	10	2.1	0.5	0.6
13		112	9.2	2.0	0.5	
14		112	8.4	1.9	0.5	
15		117	7.6	1.8	0.5	
16		110	7.6	1.7	0.4	
17		110	7.0	1.7	0.4	
18		108	5.8	1.7	0.4	
19		115	5.8	1.9	0.4	
20		101	5.3	1.8	0.4	
21		88	5.6	1.6	0.3	
22		70	7.1	1.6	0.4	
23	35	68	6.2	1.5	0.4	
24	38	61	5.5	1.2	0.4	
25	39	53	5.2	1.2	0.4	
26	38	45	4.7	1.2	0.4	
27	41	38	4.4	1.1	0.3	
28	53	31	6.3	0.9	0.3	
29	75	30	6.2	0.9	0.3	
30	79	27	4.8	0.8	0.2	
31		24		0.8	0.3	
Mean	49.8	74.5	10.1	2.1	0.2	0.2
Runoff in acre-feet	790	4,590	599	132	29	5

TABLE A-34

DAILY MEAN DISCHARGE OF PARKER CREEK
AT FOGARTY RANCH

April through September 1963
(In second-feet)

Day	April	May	June	July	August	September
1		164	66	10	4.3	
2		160	60	10	4.3	
3		194	64	9.0	4.2	
4		172	59	9.0	4.0	
5		164	57	10	4.0	
6		154	50	9.0	4.0	
7		146	46	8.1	4.0	
8		132	42	8.1	4.0	
9		148	38	6.5	4.0	
10		138	38	6.5	4.0	
11		167	34	6.5	3.8	
12		188	27	6.5	3.6	
13		210	25	6.5	3.6	
14		195	24	6.0	3.6	
15		190	23	6.0	3.6	
16		180	23	6.0	3.2	
17		174	23	6.5	3.2	
18		160	23	6.5	3.2	
19		161	17	6.5	3.2	
20		158	13	6.5	3.2	
21		144	13	6.5	2.8	
22		122	20	6.5	2.5	
23	108	122	18	6.5	2.5	
24	102	114	17	6.5	2.5	
25	100	102	13	5.2	2.5	
26	120	94	11	5.2	2.7	
27	138	86	10	5.2	2.5	
28	132	80	17	5.2	2.5	
29	144	80	18	5.2		
30	174	87	13	5.0		
31		80		5.0		
Mean	127.0	144.0	30.0	6.8	3.4	
Runoff in acre-feet	2,020	8,860	1,790	420	189	

TABLE A-35

DAILY MEAN DISCHARGE OF SHIELDS CREEK
BELOW PEPPERDINE RANCH

April through September 1963
(In second-feet)

Day	April	May	June	July	August	September
1			11	2.9	1.5	
2			10	2.5	1.5	
3			11	2.7	1.5	
4			9.8	2.9	1.5	
5			10	2.9	1.5	
6			9.5	2.7	1.5	
7			9.8	2.9	1.5	
8		28	7.0	3.2		
9		36	6.0	3.3		
10		36	6.8	4.6		
11		42	6.0	5.7		
12		50	5.5	5.2		
13		49	5.2	5.0		
14		45	4.5	4.9		
15		37	3.5	5.0		
16		33	3.2	4.7		
17		30	3.5	4.2		
18		29	5.6	2.6		
19		26	5.8	2.6		
20		28	5.2	2.6		
21		24	6.6	3.1		
22		22	7.5	3.5		
23		20	6.8	2.7		
24		16	7.0	2.7		
25		12	6.2	3.2		
26		12	6.1	3.3		
27		10	5.8	3.5		
28		11	7.0	3.5		
29		12	7.2	3.1		
30		12	5.1	3.0		
31		13		3.0		
Mean		25.8	6.8	3.5	1.5	
Runoff in acre-feet		1,260	406	214	21	

TABLE A-36

DAILY MEAN DISCHARGE OF PARKER CREEK
ABOVE HIGHWAY 395 NEAR ALTURAS

April through September 1963
(In second-feet)

Day	April	May	June	July	August	September
1			27	7.0	0.8	
2			24	5.0	0.8	
3			26	3.8	0.7	
4			21	3.2	0.6	
5			18	2.8	0.6	
6			14	2.2	0.4	
7			11	1.9	0.4	
8			9.0	1.6	0.4	
9			14	1.1	0.4	
10			26	0.9	0.4	
11			26	0.8	0.3	
12			21	2.0	0.3	
13			18	1.2	0.3	
14			18	1.2	0.2	
15			17	0.9	0.2	
16			16	0.7	0.2	
17			12	0.7		
18			7.0	0.8		
19			6.0	1.2		
20		158	5.0	1.6		
21		145	7.0	1.4		
22		132	15	1.2		
23		123	14	1.6		
24		112	14	1.6		
25		99	10	1.3		
26		84	6.0	1.2		
27		69	6.0	1.4		
28		62	9.0	1.6		
29		49	15	1.4		
30		51	9.0	1.4		
31		36		0.8		
Mean		102.0	14.7	1.7	0.4	
Runoff in acre-feet		2,220	875	110	14	

TABLE A-37

DAILY MEAN DISCHARGE OF NORTH FORK PIT RIVER
NEAR ALTURAS

April through September 1963
(In second-feet)

Day	April	May	June	July	August	September
1	90	430	118	25	1.0	1.0
2	108	405	80	20	0.8	0.9
3	140	464	110	18	0.6	0.9
4	151	436	106	15	0.7	0.9
5	157	422	76	6.1	0.7	1.0
6	841	405	47	2.2	0.8	1.0
7	852	384	35	3.6	0.9	1.0
8	545	377	25	4.6	0.9	1.1
9	433	477	18	6.6	0.8	1.7
10	363	419	11	5.4	0.9	1.5
11	328	656	83	2.6	0.9	1.3
12	290	896	41	1.9	0.9	1.0
13	287	672	10	1.7	0.9	1.0
14	328	500	11	1.9	0.9	1.0
15	314	464	42	2.2	0.9	0.9
16	335	433	20	1.9	0.9	3.2
17	416	402	22	1.7	0.9	16
18	408	377	18	2.6	1.0	6.0
19	370	374	16	4.0	1.0	3.6
20	360	370	15	4.0	1.0	2.6
21	398	338	8.9	3.3	0.9	1.9
22	414	328	16	1.9	1.0	3.4
23	468	297	31	1.7	1.0	2.6
24	388	265	24	1.3	1.0	2.2
25	346	235	14	1.2	1.0	1.9
26	450	207	16	1.2	1.0	1.9
27	629	179	13	1.0	1.0	1.9
28	436	158	11	1.2	1.0	1.7
29	412	142	36	1.2	1.0	1.7
30	430	131	26	1.0	1.2	1.7
31		149		1.0	1.2	
Mean	383	380	36.7	4.7	0.9	2.3
Runoff in acre-feet	22,780	23,390	2,180	292	57	136

TABLE A-38

DAILY MEAN DISCHARGE
OF RALPH EASTLICK DITCH

June through September 1963
(In second-feet)

Day	June	July	August	September
1				
2		2.4		
3		2.4		
4		2.5		
5		2.5		
6		2.6		
7		2.6		
8		2.6		
9		2.8		
10		3.6		
11		3.6		
12		3.6		
13		3.4		
14		3.2		
15		3.2		
16		3.1		
17		3.1		
18		3.1		
19		3.0		
20		2.8		
21		2.7		
22		2.7		
23		2.7		
24		2.7		
25		2.5		
26		2.5		
27		2.4		
28		2.3		
29		2.3		
30		2.1		
31		*1.9		
Mean		2.8		
Runoff in acre-feet		164		

* Ditch closed

TABLE A-39

DAILY MEAN DISCHARGE
OF SHACKLEFORD DITCH

June through September 1963
(In second-feet)

Day	June	July	August	September
1			8.7	9.1
2		11	9.1	8.7
3		11	9.1	8.4
4		11	8.9	8.4
5		11	12	8.4
6		11	12	8.4
7		11	13	8.0
8		10	12	7.4
9		9.8	12	7.8
10		9.1	12	7.8
11		8.7	12	7.6
12		8.4	12	7.4
13		8.4	12	6.5
14		8.2	12	6.3
15		8.7	12	5.8
16		9.1	11	5.8
17		9.1	11	5.8
18		8.9	11	5.4
19		8.7	11	5.0
20		8.4	11	
21		8.2	11	
22		8.2	11	
23		8.2	11	
24		7.8	11	
25		7.0	10	
26		7.0	10	
27		6.5	10	
28		6.3	9.1	
29		6.3	8.4	
30		7.0	9.6	
31		8.7	9.6	
Mean		8.7	10.8	6.9
Runoff in acre-feet		520	663	274

TABLE A-40

DAILY MEAN DISCHARGE
OF HOWARD JONES DITCH

June through September 1963
(In second-feet)

Day	June	July	August	September
1				
2		4.5		
3		4.3		
4		4.2		
5		4.0		
6		3.9		
7		3.7		
8		3.6		
9		3.8		
10		3.9		
11		4.0		
12		4.1		
13		5.2		
14		5.0		
15		4.8		
16		4.4		
17		4.0		
18		3.5		
19		3.2		
20		3.1		
21		2.9		
22		2.7		
23		2.7		
24		2.6		
25		2.6		
26		2.6		
27		2.5		
28		2.4		
29		2.3		
30		2.1		
31		*2.0		
Mean		3.5		
Runoff in acre-feet		207		

* Ditch closed

TABLE A-41

DAILY MEAN DISCHARGE
OF CAMP DITCH

June through September 1963
(In second-feet)

Day	June	July	August	September
1			1.8	2.4
2		4.7	2.8	2.3
3		4.6	2.6	1.8
4		3.7	2.6	1.6
5		3.4	4.7	1.6
6		3.1	3.9	1.6
7		5.6	3.6	1.8
8		6.2	2.9	2.0
9		6.3	3.4	1.6
10		5.8	3.3	1.4
11		5.6	2.9	1.4
12		5.2	2.6	1.3
13		5.1	2.6	1.6
14		4.6	2.6	2.6
15		4.4	2.4	2.5
16		3.9	2.3	2.5
17		3.8	2.2	2.5
18		3.6	2.2	2.4
19		3.6	2.1	2.4
20		3.5	2.1	2.3
21		3.5	2.2	
22		3.5	2.1	
23		3.5	2.0	
24		3.3	2.0	
25		2.9	1.9	
26		2.9	1.8	
27		2.9	1.8	
28		2.8	1.8	
29		2.7	2.5	
30		2.3	2.7	
31		1.6	2.6	
Mean		4.0	2.5	2.0
Runoff in acre-feet		235	157	78

TABLE A-42

DAILY MEAN DISCHARGE OF SHASTA RIVER
NEAR YREKA

April through September 1963
(In second-feet)

Day	April	May	June	July	August	September
1	255	199	160	144	32	95
2	234	192	157	120	33	98
3	206	202	154	100	48	98
4	185	255	154	93	34	100
5	178	266	160	93	33	105
6	230	258	164	98	34	110
7	283	276	160	100	54	88
8	269	290	160	95	62	82
9	255	286	132	91	71	88
10	241	280	132	98	82	88
11	234	332	144	100	77	80
12	206	367	147	86	43	73
13	213	381	144	66	39	68
14	259	350	120	82	36	91
15	503	311	112	100	39	105
16	467	266	91	102	38	98
17	364	248	86	91	33	110
18	346	230	88	91	42	95
19	399	224	91	88	49	98
20	415	188	93	55	55	123
21	407	199	110	49	54	141
22	381	220	129	59	49	135
23	370	216	141	54	50	129
24	336	202	157	48	43	126
25	300	196	132	57	43	118
26	266	174	118	54	43	112
27	266	178	135	44	52	123
28	248	164	118	44	52	108
29	234	164	110	43	59	110
30	206	157	154	46	59	115
31		164		39	105	
Mean	292	240	132	78.4	49.8	104
Runoff in acre-feet	17,370	14,750	7,840	4,820	3,060	6,170

TABLE A-43

DAILY MEAN DISCHARGE OF
BIG SPRINGS IRRIGATION DISTRICT FLUME

April through September 1963
(In second-feet)

Day	April	May	June	July	August	September
1		17	27	14	29	31
2		17	27	27	29	22
3		17	26	27	30	31
4		18	24	27	30	31
5		18	24	27	30	25
6		20	24	27	30	22
7		22	24	27	30	22
8		24	24	27	30	21
9		24	24	27	30	25
10		21	24	27	30	30
11		10	24	27	31	32
12		0	21	27	31	28
13		0	20	27	30	24
14		0	24	28	30	31
15		0	28	28	30	33
16		14	28	28	30	34
17		22	28	28	30	34
18		24	27	28	30	
19		26	28	28	30	
20		25	28	28	30	
21		22	28	27	30	
22		18	28	24	30	
23		18	28	24	30	
24		19	28	29	31	
25		19	28	29	31	
26	16	19	28	29	31	
27	16	21	28	29	31	
28	17	22	16	29	31	
29	17	27	0	29	31	
30	17	27	0	29	31	
31		27		29	31	
Mean	16.6	18.0	23.9	27.1	29.9	28.0
Runoff in acre-feet	165	1,110	1,420	1,670	1,840	944

TABLE A-44

DAILY MEAN DISCHARGE OF PARKS CREEK
ABOVE EDSON-FOULKE YREKA DITCH

April through September 1963
(In second-feet)

Day	April	May	June	July	August	September
1			50	22	12	5.5
2			48	22	12	5.5
3			45	20	12	5.5
4			41	22	12	5.5
5			42	20	12	5.5
6			38	17	10	5.5
7			37	17	9.0	5.0
8			37	17	15	5.0
9			36	16	15	5.0
10			36	16	12	5.0
11			36	16	11	5.0
12			36	18	14	5.0
13			35	20	14	
14			35	20	14	
15			35	20	14	
16			36	20	13	
17			35	20	13	
18			34	15	13	
19			33	10	11	
20			31	9.5	6.5	
21			31	9.0	6.0	
22			32	12	6.0	
23		85	31	15	6.0	
24		80	28	14	6.0	
25		73	25	14	6.0	
26		70	24	14	6.0	
27		62	25	13	6.0	
28		60	26	13	6.0	
29		60	26	13	5.5	
30		59	24	13	5.5	
31		53		13	5.5	
Mean		66.9	34.3	16.1	10.0	5.2
Runoff in acre-feet		1,190	2,040	992	613	125

TABLE A-45

DAILY MEAN DISCHARGE OF SHASTA RIVER
AT EDGEWOOD

March through September 1963
(In second-feet)

Day	March	April	May	June	July	August	September
1	108	113	84	102	27	75	
2	107	99	84	93	55	75	
3	110	92	91	86	81	75	
4	103	88	99	82	82	73	
5	100	109	114	105	81	75	
6	101	195	121	84	81		
7	97	176	179	79	81		
8	95	143	237	70	81		
9	93	125	160	58	81		
10	91	129	114	57	80		
11	86	126	119	54	80		
12	83	323	103	52	80		
13	81	303	95	53	80		
14	81	1,030	92	55	79		
15	82	516	94	56	80		
16	81	310	94	56	79		
17	85	208	100	55	79		
18	83	159	110	62	79		
19	84	148	126	68	77		
20	82	120	156	62	79		149
21	79	113	178	54	77		148
22	73	102	173	54	77		147
23	88	96	163	50	77		147
24	82	93	158	42	76		143
25	77	90	141	37	76		142
26	73	89	130	33	76		146
27	207	87	116	31	76		143
28	160	86	113	46	76		143
29	128	90	124	37	76		145
30	122	88	117	35	75		145
31	126		113		75		
Mean	98.3	182	126	60.3	76.1	74.6	145
Runoff in acre-feet	6,050	10,800	7,730	3,590	4,680	740	3,170

TABLE A-46

DAILY MEAN DISCHARGE OF SHASTA RIVER
AT MONTAGUE-GRENADA HIGHWAY BRIDGE

April through September 1963
(In second-feet)

Day	April	May	June	July	August	September
1					42	85
2					52	92
3					42	94
4					41	94
5				79	39	94
6				78	44	94
7				78	58	76
8				78	68	78
9				77	73	83
10				76	73	77
11				76	61	77
12				76	40	61
13				68	38	68
14				88	32	79
15				94	38	82
16				94	38	82
17				84	39	85
18				85	47	
19				68	54	
20				50	56	
21				54	49	
22				53	54	
23				50	45	
24				50	38	
25				56	39	
26				45	45	
27				52	52	
28				50	54	
29				54	56	
30				52	61	
31				44	108	
Mean				67.0	50.8	82.4
Runoff in acre-feet				3,590	3,120	2,780

TABLE A-47

DAILY MEAN DISCHARGE OF
LITTLE SHASTA RIVER NEAR MONTAGUE

March through September 1963
(In second-feet)

Day	March	April	May	June	July	August	September
1	29	24	43	21	8.9	5.5	4.2
2	27	20	43	20	8.6	5.7	4.2
3	26	20	45	19	8.5	5.3	4.2
4	24	20	46	19	7.5	5.6	4.0
5	23	38	46	21	7.4	5.0	4.0
6	24	100	46	19	7.3	4.8	4.0
7	22	83	54	17	7.1	5.0	3.7
8	21	59	51	16	7.3	5.1	4.0
9	20	51	51	14	7.1	5.1	4.2
10	19	47	47	15	6.8	5.0	4.2
11	18	42	53	16	7.0	4.8	4.2
12	18	36	48	15	7.3	4.8	4.3
13	16	35	43	14	7.1	4.8	4.3
14	17	124	39	12	6.7	4.8	4.2
15	17	73	41	11	5.8	4.8	4.0
16	17	59	37	12	6.1	5.1	4.2
17	16	49	36	13	6.4	5.1	4.0
18	16	45	35	15	6.4	5.0	4.0
19	23	42	34	14	6.5	4.8	4.2
20	28	37	33	11	5.8	4.9	4.0
21	26	34	33	11	6.0	5.3	4.2
22	22	39	32	12	5.7	5.3	4.0
23	21	44	31	12	5.6	5.1	3.8
24	19	42	30	11	5.5	5.1	3.8
25	17	36	28	10	5.3	5.1	3.8
26	17	35	27	9.6	5.3	5.1	3.8
27	20	34	26	9.4	5.2	5.1	3.6
28	26	40	26	11	4.8	4.8	3.6
29	25	46	25	12	5.1	4.8	3.3
30	27	47	23	10	5.8	4.5	3.3
31	32		22		5.7	4.2	
Mean	21.7	46.7	37.9	14.1	6.5	5.0	4.0
Runoff in acre-feet	1,330	2,780	2,330	837	400	308	237

TABLE A-48

DAILY MEAN DISCHARGE OF EDSON-FOULKE YREKA DITCH
AT SHASTA RIVER

April through September 1963
(In second-feet)

Day	April	May	June	July	August	September
1			25	23	12	7.3
2			21	29	12	4.9
3			16	31	11	4.3
4			13	31	11	4.1
5			16	32	11	4.1
6			11	32	9.6	4.5
7			9.4	32	9.6	4.5
8			14	30	9.9	4.3
9			23	27	9.6	4.5
10			24	24	9.4	4.5
11			23	24	8.7	4.3
12			23	24	7.7	4.3
13			24	24	6.7	
14			25	24	7.1	
15			25	23	6.7	
16			26	19	6.5	
17			25	19	6.0	
18			24	18	6.0	
19			24	17	6.0	
20			23	16	6.0	
21			23	16	6.0	
22			23	16	6.0	
23		31	23	17	5.8	
24		31	22	16	5.1	
25		27	22	16	5.1	
26		29	21	16	4.9	
27		34	19	15	4.7	
28		34	23	15	4.9	
29		33	20	13	5.2	
30		31	20	13	5.4	
31		29		12	6.5	
Mean		31.0	21.0	21.4	7.4	4.6
Runoff in acre-feet		553	1,250	1,320	460	110

TABLE A-49

DAILY MEAN DISCHARGE OF EDSON-FOULKE YREKA DITCH
NORTH OF PARKS CREEK

April through September 1963
(In second-feet)

Day	April	May	June	July	August	September
1			33	26	13	4.5
2			30	31	13	4.0
3			25	31	13	3.6
4			19	33	12	3.6
5			24	32	12	3.6
6			15	29	11	3.6
7			16	29	10	3.6
8			27	28	10	3.6
9			35	26	9.2	3.6
10			37	23	9.0	3.4
11			35	23	8.5	3.4
12			35	23	8.0	3.4
13			35	23	6.5	
14			34	22	6.5	
15			34	21	6.3	
16			35	18	6.0	
17			35	18	5.8	
18			34	15	5.8	
19			33	13	5.5	
20			33	13	5.5	
21			37	13	5.6	
22			41	14	5.6	
23			40	16	5.6	
24			34	15	5.0	
25			30	16	5.0	
26			28	16	4.7	
27			28	15	4.5	
28			33	14	4.5	
29			31	14	4.5	
30		39	21	13	4.0	
31		36		13	3.6	
Mean		37.5	30.9	20.5	7.4	3.7
Runoff in acre-feet		149	1,840	1,260	455	87

DAILY MEAN STORAGE IN DWINNELL RESERVOIR

October 1, 1962 through September 30, 1963 in acre-feet

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	2,090	12,320	16,900	26,030	29,450	40,450	40,810	47,190	44,440	37,390	28,600	20,270
2	1,990	12,410	17,350	26,120	30,880	40,420	40,870	47,070	44,170	37,130	28,320	20,030
3	2,050	12,480	18,280	26,180	32,080	40,420	40,890	47,000	43,900	36,790	28,000	19,820
4	2,030	12,560	18,770	26,270	33,310	40,400	40,910	46,960	43,670	36,510	27,700	19,610
5	2,010	12,560	19,150	26,340	34,900	40,380	40,960	46,960	43,450	36,170	27,400	19,400
6	2,200	12,700	19,430	26,400	35,940	40,330	41,160	47,860	43,180	35,910	27,170	19,170
7	2,320	12,790	19,680	26,460	36,620	40,310	41,440	47,860	42,910	35,640	26,870	18,980
8	2,320	12,850	19,890	26,520	37,190	40,280	41,640	47,030	42,730	35,350	26,570	18,770
9	2,320	12,920	20,100	26,570	37,640	40,230	41,720	47,190	42,440	35,090	26,300	18,590
10	2,770	13,010	20,270	26,600	38,020	40,180	41,860	47,190	42,230	34,810	26,000	18,350
11	3,640	13,090	20,450	26,620	38,270	40,110	42,050	47,210	42,000	34,410	25,670	18,170
12	5,080	13,230	20,590	26,600	38,530	40,040	42,400	47,190	41,740	34,140	25,480	17,950
13	7,980	13,440	20,800	26,620	38,840	39,970	42,910	47,100	41,470	33,840	25,160	17,690
14	8,740	13,580	21,080	26,630	39,020	40,010	44,260	47,010	41,180	33,520	24,860	17,540
15	9,150	13,690	21,570	26,640	39,170	40,020	45,790	46,920	40,930	33,220	24,620	17,380
16	9,550	13,780	22,410	26,680	39,340	40,010	46,490	46,780	40,760	32,920	24,350	17,220
17	10,000	13,880	23,110	26,680	39,630	39,990	46,920	46,640	40,700	32,640	24,050	17,120
18	10,350	13,970	23,600	26,690	39,770	39,990	47,140	46,470	40,620	32,320	23,780	16,960
19	10,600	14,060	23,980	26,710	39,910	39,970	47,300	46,330	40,620	32,060	23,490	16,870
20	10,800	14,160	24,280	26,710	40,040	39,970	47,400	46,150	40,380	31,760	23,250	16,750
21	11,000	14,210	24,560	26,420	40,140	39,940	47,460	46,150	40,060	31,440	22,950	16,650
22	11,170	14,300	24,770	26,440	40,230	39,910	47,500	46,130	39,800	31,120	22,730	16,580
23	11,320	14,400	25,020	26,750	40,280	39,850	47,540	46,060	39,570	30,880	22,480	16,400
24	11,500	14,520	25,250	26,750	40,330	39,820	47,570	45,970	39,290	30,560	22,170	16,320
25	11,600	14,640	25,400	26,750	40,400	39,800	47,540	45,880	39,000	30,210	21,840	16,220
26	11,720	15,200	25,470	26,750	40,480	39,790	47,450	45,700	38,720	29,920	21,670	16,050
27	11,830	16,040	25,580	26,760	40,480	39,940	47,400	45,520	38,140	29,600	21,430	15,930
28	11,930	16,340	25,700	26,780	40,470	40,330	47,360	45,340	38,100	29,400	21,220	15,800
29	12,030	16,530	25,820	26,820		40,500	47,320	45,120	37,900	29,270	20,940	15,640
30	12,130	16,700	25,860	26,900		40,590	47,280	44,960	37,640	29,150	20,690	15,500
31	12,230		25,920	27,560		40,690		44,750		28,920	20,490	

TABLE A-51

DAILY MEAN RELEASES
FROM DWINNELL RESERVOIR

April through October 1963
(In second-feet)

Day	April	May	June	July	August	September	October
1		28	95	73	90	80	51
2		28	93	72	94	79	53
3		35	87	66	93	76	54
4		35	82	65	92	72	54
5		35	81	64	92	72	57
6		37	83	67	93	72	48
7		24	84	66	95	72	50
8		34	79	66	91	72	39
9		34	78	68	88	72	29
10		30	71	69	86	68	**14
11		27	71	69	85	62	
12		27	76	73	85	62	
13		27	80	76	85	62	
14		27	84	77	86	60	
15		30	82	78	87	58	
16		39	30	78	87	47	
17		45	8.5	79	87	37	
18		52	11	79	87	40	
19	* 2.5	61	20	80	87	39	
20	8.5	80	66	82	87	37	
21	11	79	75	85	87	35	
22	6.0	79	75	90	87	35	
23	0	79	75	92	87	34	
24	5.0	80	75	93	87	33	
25	17	81	78	94	88	33	
26	17	83	80	96	87	39	
27	17	93	80	96	87	49	
28	17	96	78	56	86	44	
29	11	96	74	20	85	56	
30	14	95	74	22	84	49	
31		95		66	83		
Mean	10.5	54.5	70.8	72.8	87.8	54.9	44.9
Runoff in acre-feet	250	3,350	4,220	4,480	5,400	3,260	890

* Reservoir opened
** Reservoir closed

TABLE A-52

DAILY MEAN DISCHARGE
SHASTA RIVER WATER ASSOCIATION PUMPING PLANT

March through October 1963
(In second-feet)

Day	March	April	May	June	July	August	September	October
1		16	46	46	46	46	31	31
2		16	46	46	46	26	31	31
3		25	46	46	46	37	31	36
4		46	46	42	46	46	31	38
5		46	46	44	46	46	31	38
6		46	46	46	46	46	34	38
7		46	46	25	46	46	46	42
8		46	46	41	45	46	46	46
9		46	38	46	46	34	46	46
10		27	16	46	43	46	46	46
11		16	16	46	46	46	43	**15
12		16	6.1	46	46	46	36	
13		16	26	46	46	46	46	
14		16	37	45	46	46	46	
15		8.9	46	46	46	46	46	
16		0	46	46	46	46	46	
17		12	46	46	46	46	46	
18		12	42	46	46	46	46	
19		0	46	46	46	46	46	
20		0	46	46	46	46	46	
21		0	46	46	46	46	46	
22		0	46	46	46	46	46	
23	* 5.0	13	46	46	46	46	46	
24	7.0	43	46	39	46	46	46	
25	7.0	46	46	39	46	46	46	
26	38	46	46	40	46	46	46	
27	34	46	46	46	45	46	46	
28	0	46	40	46	46	46	37	
29	5.5	46	46	46	46	46	31	
30	16	46	46	46	45	32	31	
31	16		46		46	3.8		
Mean	14.3	25.4	41.3	44.2	45.8	42.9	41.4	37.0
Runoff in acre-feet	255	1,510	2,540	2,630	2,820	2,640	2,460	807

* Plant opened
** Plant closed

TABLE A-53

DAILY MEAN DISCHARGE
OF GRENADA IRRIGATION DISTRICT PUMPING PLANT

April through September 1963
(In second-feet)

Day	April	May	June	July	August	September

Discharge Data Unavailable as of Report Date

TABLE A-54

DAILY MEAN DISCHARGE OF SOUTH FORK PIT RIVER
NEAR LIKELY

April through September 1963
(In second-feet)

Day	April	May	June	July	August	September
1	11	242	280	59	114	87
2	7.4	258	245	53	111	66
3	12	285	240	50	109	62
4	9.5	307	232	47	113	62
5	11	328	288	45	117	63
6	170	352	250	47	133	65
7	150	340	209	48	164	71
8	113	313	189	43	174	79
9	101	352	174	38	183	89
10	109	295	176	36	168	95
11	106	370	174	33	150	95
12	93	399	154	32	148	83
13	83	331	139	30	143	51
14	103	292	141	30	143	35
15	103	298	135	32	143	33
16	93	325	133	39	141	30
17	101	352	130	53	135	23
18	103	373	121	65	135	28
19	106	388	133	74	133	33
20	117	448	139	76	132	32
21	128	476	148	81	143	34
22	199	486	166	83	150	30
23	227	438	166	74	150	27
24	178	399	128	73	148	26
25	150	370	101	74	146	25
26	205	340	93	76	148	25
27	278	313	83	72	114	24
28	232	295	83	62	90	24
29	213	304	93	60	90	23
30	222	288	74	81	90	18
31		298		113	92	
Mean	124	344	161	57.4	134	47.9
Runoff in acre-feet	7,410	21,130	9,550	3,530	8,230	2,850

TABLE A-55

DAILY MEAN DISCHARGE OF SOUTH FORK PIT RIVER
NEAR JESS VALLEY

March through September 1963
(In second-feet)

Day	March	April	May	June	July	August	September
1	12	15	183	227	58	21	13
2	9.4	14	208	198	50	17	12
3	9.8	14	236	199	48	15	10
4	13	11	249	189	47	16	11
5	14	19	269	246	45	16	10
6	11	109	301	205	46	15	12
7	10	103	295	168	48	15	11
8	9.7	95	274	158	45	16	9.7
9	9.0	81	282	144	38	22	12
10	8.1	83	233	144	37	22	11
11	7.9	75	274	149	34	18	12
12	7.9	61	295	130	33	17	13
13	12	58	228	118	30	13	16
14	9.7	79	204	120	29	13	14
15	8.7	79	222	116	33	14	12
16	10	71	257	116	33	11	15
17	9.0	77	283	115	31	9.4	18
18	9.3	76	313	109	33	9.3	26
19	16	73	338	108	36	8.8	31
20	19	76	400	108	34	8.5	31
21	13	85	434	116	32	9.0	31
22	8.3	119	442	131	25	9.7	27
23	8.3	137	383	141	23	9.4	25
24	8.7	96	345	118	22	9.3	24
25	8.7	82	318	102	24	9.1	23
26	9.0	118	290	95	25	11	22
27	10	162	269	82	26	9.2	22
28	15	119	248	83	23	9.6	22
29	14	121	246	91	21	9.2	20
30	8.5	150	232	78	20	10	16
31	12		242		19	12	
Mean	10.7	81.9	284	137	33.8	13.0	17.7
Runoff in acre-feet	657	4,880	17,440	8,140	2,080	802	1,060

TABLE A-56

DAILY MEAN DISCHARGE OF WEST VALLEY CREEK
BELOW WEST VALLEY RESERVOIR

April through September 1963
(In second-feet)

Day	April	May	June	July	August	September
1		61	28	3.5	97	79
2		56	26	3.5	97	56
3		55	23	3.1	97	56
4		57	22	2.8	102	56
5		57	23	3.0	108	56
6	* 0	56	23	2.8	127	56
7	0.2	52	23	3.1	159	63
8	0.7	52	21	1.9	164	72
9	4.0	60	20	1.5	164	81
10	9.0	60	19	1.3	148	87
11	12	66	19	1.2	136	87
12	22	95	19	1.2	136	73
13	22	93	18	1.6	138	34
14	22	81	17	2.0	138	22
15	22	73	17	1.4	136	22
16	23	67	15	6.4	136	14
17	26	60	15	24	136	≠ 2.4
18	30	53	14	**34	136	
19	32	50	20	40	136	
20	35	46	30	45	136	
21	40	41	26	52	146	
22	44	41	25	59	150	
23	46	39	24	52	150	
24	52	38	6.6	52	150	
25	57	35	1.8	52	150	
26	60	32	3.3	52	150	
27	63	30	3.9	47	116	
28	67	29	2.4	42	87	
29	78	29	2.6	42	87	
30	67	28	2.8	63	87	
31		30		97	87	
Mean	34.7	52.3	17.0	25.6	129	53.9
Runoff in acre-feet	1,650	3,220	1,010	1,570	7,910	1,820

* Reservoir began to spill
** Reservoir ceased spilling
≠ Reservoir gates closed

TABLE A-57

DAILY MEAN DISCHARGE OF BOWMAN DITCH
ON NORTH FORK FITZHUGH CREEK

April through September 1963
(In second-feet)

Day	April	May	June	July	August	September
1					2.9	2.9
2					3.0	2.7
3					3.0	2.6
4					3.0	2.5
5					3.1	2.5
6					3.1	2.5
7					3.1	2.4
8					3.2	2.4
9					3.2	2.5
10					3.2	2.4
11					3.2	2.4
12					3.1	2.9
13					2.9	2.9
14					2.8	2.7
15					2.7	2.8
16					2.6	2.9
17					2.6	2.9
18					2.9	2.8
19					2.9	2.8
20					2.9	2.9
21					2.9	2.9
22					2.9	2.9
23					3.0	* 0
24					2.9	
25					2.8	
26					2.7	
27				2.7	2.7	
28				2.7	2.6	
29				2.7	2.6	
30				2.7	2.8	
31				2.9	2.8	
Mean				2.7	2.9	2.7
Runoff in acre-feet				27	179	117

* Ditch closed

TABLE A-58

DAILY MEAN DISCHARGE OF NORTH FORK FITZHUGH CREEK
BELOW BOWMAN DITCH

April through September 1963
(In second-feet)

Day	April	May	June	July	August	September
1					1.4	1.1
2					1.4	1.0
3					1.3	0.9
4					1.2	0.9
5					1.2	0.9
6					1.2	0.9
7					1.2	0.9
8					1.2	0.9
9					1.4	0.8
10					1.3	0.9
11					1.2	0.8
12					1.2	1.1
13					1.1	1.0
14					1.0	0.8
15					1.0	0.7
16					0.9	0.8
17					0.9	0.8
18					1.0	0.8
19					1.0	0.8
20					1.0	0.8
21					1.0	0.7
22					1.0	0.7
23					1.0	1.2
24					0.9	2.0
25					0.9	
26					0.9	
27				1.3	0.9	
28				1.3	0.9	
29				1.2	0.9	
30				1.3	1.0	
31				1.4	1.0	
Mean				1.3	1.1	0.9
Runoff in acre-feet				13	66	44

TABLE A-59

DAILY MEAN DISCHARGE OF FITZHUGH CREEK
BELOW DIVERSION #137

April through September 1963
(In second-feet)

Day	April	May	June	July	August	September
1			27	6.5	2.9	3.6
2			20	4.6	2.8	3.4
3			22	5.0	2.9	3.4
4			22	4.6	3.1	3.2
5			27	4.8	3.1	3.4
6			21	4.6	3.2	3.7
7			18	3.7	3.1	3.7
8			16	3.7	3.4	3.4
9			14	3.8	3.6	3.2
10			15	3.7	4.2	3.2
11			15	3.4	3.4	3.2
12			13	3.6	3.2	3.2
13			11	3.4	3.1	3.4
14			10	3.4	2.9	3.4
15			8.0	3.2	2.7	3.6
16			7.4	3.4	2.5	3.7
17		58	7.6	3.2	2.7	4.2
18		55	7.4	3.2	2.9	5.0
19		54	5.8	3.4	2.8	5.0
20		55	6.5	3.1	2.9	5.0
21		55	9.2	3.1	3.1	5.0
22		57	14	3.0	3.2	4.6
23		49	16	3.1	3.4	4.4
24		42	12	3.0	3.2	
25		39	9.0	3.1	3.1	
26		36	6.5	3.2	3.0	
27		32	5.8	3.1	3.1	
28		30	6.0	2.9	3.1	
29		28	11	3.1	3.1	
30		27	8.8	3.1	3.1	
31		27		3.1	3.6	
Mean		42.9	13.1	3.6	3.1	3.8
Runoff in acre-feet		1,280	746	222	191	174

TABLE A-60

DAILY MEAN DISCHARGE OF PINE CREEK
NEAR ALTURAS

April through September 1963
(In second-feet)

Day	April	May	June	July	August	September
1		37	84	37	16	16
2		36	81	36	16	15
3		46	81	33	16	14
4		45	75	33	16	14
5		52	74	32	15	15
6		56	63	32	15	16
7		55	60	31	15	15
8		52	58	31	14	15
9		76	56	31	18	15
10		51	57	30	16	14
11		83	55	30	15	12
12		96	53	29	14	17
13		73	48	29	14	16
14		53	46	28	13	14
15		56	50	27	13	12
16		64	54	26	13	12
17	*34	70	55	26	14	13
18	37	76	57	25	14	13
19	28	90	57	23	14	14
20	34	110	56	23	14	14
21	42	98	56	22	15	14
22	51	103	58	22	15	12
23	33	107	55	21	14	12
24	19	108	51	21	14	10
25	16	103	48	21	15	9.4
26	51	99	45	20	15	10
27	59	95	43	19	14	11
28	33	91	45	18	14	10
29	26	90	43	18	14	11
30	31	87	39	18	17	10
31		86		17	16	
Mean	35.3	75.6	56.8	26.1	14.8	13.2
Runoff in acre-feet	980	4,650	3,380	1,600	908	784

* New gaging station installed replacing one washed out during flood period of October 1962

TABLE A-61

DAILY MEAN DISCHARGE OF BIDWELL CREEK
NEAR FORT BIDWELL

March through September 1963
(In second-feet)

Day	March	April	May	June	July	August	September
1	19	13	65	77	23	7.8	5.2
2	19	13	64	68	22	7.8	5.3
3	19	14	76	64	21	7.5	5.0
4	18	15	76	61	20	7.2	5.0
5	17	35	78	62	19	7.1	5.0
6	18	90	81	56	18	7.0	5.1
7	17	65	90	55	18	7.0	5.1
8	17	55	90	55	17	7.1	5.0
9	16	49	81	54	15	8.7	4.7
10	15	45	75	53	14	7.5	5.0
11	15	43	73	50	14	7.1	4.7
12	14	41	71	48	13	6.4	5.3
13	15	40	70	48	13	6.3	5.3
14	14	44	70	47	12	5.9	5.1
15	14	44	87	46	12	5.8	6.6
16	14	42	97	45	11	5.6	6.8
17	14	39	112	42	12	5.6	5.2
18	13	39	137	39	11	5.8	5.2
19	13	39	154	38	11	5.7	5.4
20	14	39	149	36	10	5.6	5.6
21	13	37	150	35	10	5.6	5.5
22	13	38	140	36	9.9	5.8	5.2
23	12	40	125	33	9.8	5.6	5.0
24	12	42	116	31	9.5	5.6	4.7
25	11	43	106	28	9.5	5.5	4.4
26	12	43	98	27	9.3	5.6	4.3
27	13	44	88	26	9.1	5.3	4.1
28	13	45	79	28	8.1	5.3	3.9
29	13	52	77	27	8.1	5.1	4.2
30	13	61	75	25	7.8	5.2	4.1
31	13		78		7.8	5.4	
Mean	14.6	41.6	94.5	44.7	13.1	6.3	5.0
Runoff in acre-feet	899	2,480	5,810	2,660	803	386	300

TABLE A-62

DAILY MEAN DISCHARGE
OF MILL CREEK

April through September 1963
(In second-feet)

Day	April	May	June	July	August	September
1	10	48	31	9.0	2.7	2.0
2	10	45	28	8.5	2.6	1.9
3	11	58	27	8.1	2.6	1.9
4	13	49	24	7.4	2.5	1.8
5	22	49	23	7.0	2.5	1.8
6	35	52	21	7.0	2.4	1.9
7	30	48	19	6.7	2.3	1.8
8	27	45	18	6.3	2.4	1.7
9	26	43	18	5.9	2.9	1.7
10	25	34	18	5.6	2.5	1.7
11	24	31	16	5.6	2.3	1.7
12	21	27	15	5.3	2.3	3.2
13	28	24	15	4.9	2.2	2.4
14	30	24	14	4.7	2.2	2.4
15	22	28	14	4.4	2.1	2.3
16	16	33	14	4.4	2.1	2.3
17	15	41	13	4.2	2.1	2.2
18	15	50	13	3.7	2.0	2.1
19	14	54	12	3.7	2.1	2.1
20	14	59	12	3.7	2.2	2.0
21	15	65	13	3.5	2.2	2.0
22	15	71	15	3.5	2.1	1.9
23	16	65	13	3.4	2.1	1.8
24	17	64	13	3.4	2.1	1.7
25	17	49	12	3.4	2.0	1.6
26	24	45	11	3.2	2.0	1.6
27	25	41	10	3.2	1.9	1.6
28	25	32	11	3.0	1.9	1.6
29	34	30	12	3.0	1.9	1.6
30	43	31	10	2.9	2.0	1.6
31		33		2.9	2.0	
Mean	21.3	44.1	16.2	4.9	2.2	1.9
Runoff in acre-feet	1,270	2,710	962	301	138	115

TABLE A-63

DAILY MEAN DISCHARGE
OF SOLDIER CREEK

March through September 1963
(In second-feet)

Day	March	April	May	June	July	August	September
1		5.9	28	11	4.5	2.1	1.8
2		6.3	32	10	4.3	2.1	1.8
3		6.5	39	11	4.1	2.1	1.7
4		9.5	43	11	4.0	2.1	1.7
5		30	51	10	3.8	2.0	1.7
6		50	40	9.4	3.6	2.0	1.7
7		25	41	8.3	3.5	2.0	1.7
8		20	30	7.5	3.4	2.0	1.6
9		17	25	7.0	3.3	2.8	1.6
10		14	23	6.8	3.3	2.7	1.6
11		12	24	6.7	3.2	2.5	1.6
12		11	25	6.5	3.1	2.4	4.2
13		11	25	6.3	3.0	2.3	3.8
14		18	26	6.2	2.8	2.2	3.1
15		16	28	6.0	2.7	2.1	2.6
16		11	28	5.7	2.6	2.0	2.2
17		12	29	5.4	2.6	2.0	1.9
18		13	31	5.2	2.5	1.9	1.7
19	5.4	11	38	5.0	2.5	1.8	1.7
20	5.5	9.8	40	4.9	2.4	2.0	1.7
21	5.5	8.5	37	4.7	2.4	2.0	1.6
22	5.3	9.4	33	7.0	2.4	2.0	1.6
23	5.3	11	31	6.2	2.3	1.9	1.6
24	5.3	12	31	5.1	2.3	1.9	1.6
25	5.5	13	27	4.7	2.3	1.9	1.5
26	5.5	15	21	4.4	2.3	1.9	1.5
27	5.4	13	16	3.9	2.2	1.9	1.5
28	5.6	21	14	6.5	2.2	1.9	1.5
29	5.6	33	13	8.0	2.2	1.8	1.5
30	5.6	35	12	6.0	2.2	1.8	1.5
31	5.6		13		2.2	1.8	
Mean	5.5	16.0	28.8	5.3	2.9	2.1	1.9
Runoff in acre-feet	141	952	1,770	315	179	127	113

TABLE A-64

DAILY MEAN DISCHARGE
OF PINE CREEK

March through September 1963
(In second-feet)

Day	March	April	May	June	July	August	September
1		2.7	20	2.3	0.3		
2		2.8	22	2.2	0.3		
3		3.0	21	3.1	0.3		
4		3.5	18	2.7	0.3		
5		30	21	2.5	0.3		
6		40	16	2.0	0.2		
7		22	16	1.8	0.2		
8		17	15	1.7	0.2		
9		14	13	1.5	0.2		
10		12	13	1.4	0.1		
11		10	15	1.2	0.1		
12		9.0	14	1.0	0.1		0.5
13		11	13	0.9	0.1		0.4
14		18	12	0.9	0.1		0.3
15		14	11	0.8	0.1		0.3
16		11	11	0.8	0.1		0.2
17		10	10	0.8	0.1		0.1
18		8.0	9.2	0.8	0.1		0.1
19		7.5	8.5	0.7			
20	2.3	7.0	8.0	0.8			
21	2.1	6.5	7.6	0.8			
22	2.1	6.0	7.1	1.0			
23	2.2	7.5	6.3	0.7			
24	2.3	7.3	5.4	0.6			
25	2.3	6.7	4.6	0.5			
26	2.5	7.1	4.1	0.4			
27	2.4	10	3.8	0.3			
28	2.5	15	3.3	0.4			
29	2.5	22	2.9	0.4			
30	2.5	23	2.6	0.4			
31	2.5		2.4				
Mean	2.4	12.1	10.9	1.2	0.1	0.0	0.1
Runoff in acre-feet	56	721	668	70	6	0	4

TABLE A-65

DAILY MEAN DISCHARGE OF CEDAR CREEK
AT CEDARVILLE

March through September 1963
(In second-feet)

Day	March	April	May	June	July	August	September
1	9.5	8.2	33	10	3.8	1.0	0.5
2	9.2	8.3	33	9.7	3.1	0.9	0.5
3	8.2	8.2	33	9.3	3.1	0.9	0.4
4	7.5	8.2	35	8.8	3.2	0.8	0.4
5	7.2	10	36	8.4	3.2	0.8	0.4
6	7.0	30	37	8.0	3.3	0.8	0.4
7	7.0	42	37	7.6	3.3	0.7	0.3
8	6.4	43	38	7.2	2.4	0.7	0.3
9	7.0	46	38	6.9	2.4	1.2	0.3
10	6.4	49	39	6.5	2.3	1.1	0.3
11	5.9	47	40	6.1	2.2	1.0	0.2
12	5.4	40	45	5.8	2.2	0.9	1.5
13	5.4	38	46	5.7	2.2	0.6	1.1
14	5.4	38	43	5.6	2.1	0.3	0.9
15	5.4	41	39	5.5	2.0	0.3	0.8
16	5.4	38	36	5.4	2.0	0.4	0.6
17	5.4	35	31	5.3	1.9	0.4	0.6
18	5.3	34	29	5.1	1.9	0.4	0.6
19	4.7	32	28	4.9	1.8	0.4	0.5
20	4.5	29	26	4.7	1.6	0.5	0.5
21	4.7	26	22	4.5	1.4	0.5	0.5
22	4.7	24	21	5.6	1.4	0.5	0.5
23	4.9	23	18	4.8	1.3	0.6	0.4
24	4.9	22	17	3.9	1.2	0.6	0.4
25	4.7	23	15	3.7	1.2	0.7	0.4
26	5.2	23	13	3.4	1.2	0.7	0.4
27	5.5	24	11	3.2	1.2	0.7	0.4
28	7.0	25	12	5.3	1.1	0.6	0.4
29	7.5	27	11	4.8	1.1	0.6	0.3
30	8.2	29	11	4.3	1.0	0.6	0.3
31	8.2		10		1.0	0.5	
Mean	6.3	29.0	28.5	6.0	2.0	0.7	0.5
Runoff in acre-feet	385	1,730	1,750	357	125	41	30

TABLE A-66

DAILY MEAN DISCHARGE
OF NORTH DEEP CREEK

April through September 1963
(In second-feet)

Day	April	May	June	July	August	September
1	3.2	17	8.4	1.8	0.8	0.6
2	3.3	18	7.2	1.7	0.8	0.6
3	3.4	17	6.6	1.6	0.7	0.6
4	3.5	18	5.9	1.6	0.7	0.6
5	7.9	22	5.5	1.6	0.6	0.6
6	11	18	5.2	1.6	0.6	0.6
7	10	17	5.0	1.5	0.6	0.6
8	8.7	16	4.9	1.5	0.8	0.6
9	8.2	15	4.7	1.4	1.3	0.6
10	8.0	14	4.6	1.4	1.0	0.6
11	6.9	14	4.6	1.3	0.9	0.6
12	5.9	16	4.1	1.2	0.9	1.3
13	5.3	16	3.8	1.2	0.8	0.9
14	9.2	17	3.7	1.1	0.8	0.8
15	7.7	18	3.5	1.1	0.8	0.8
16	6.4	17	3.5	1.0	0.8	0.8
17	5.9	17	3.4	1.0	0.8	0.8
18	5.6	18	3.1	1.0	0.7	0.8
19	5.4	18	2.9	0.9	0.7	0.8
20	5.3	18	2.7	0.9	0.7	0.7
21	5.1	20	2.6	0.9	0.7	0.7
22	4.9	19	3.2	0.9	0.7	0.6
23	10	18	2.7	0.9	0.7	0.6
24	12	17	2.4	0.8	0.7	0.6
25	14	15	2.3	0.8	0.7	0.6
26	15	14	2.1	0.8	0.7	0.6
27	15	13	1.9	0.8	0.7	0.6
28	15	11	2.2	0.8	0.7	0.6
29	15	11	2.0	0.8	0.6	0.6
30	18	10	1.8	0.8	0.6	0.5
31		9.4		0.8	0.6	
Mean	8.5	16.1	3.9	1.1	0.7	0.7
Runoff in acre-feet	505	989	231	70	46	40

TABLE A-67

DAILY MEAN DISCHARGE
OF SOUTH DEEP CREEK

April through September 1963
(In second-feet)

Day	April	May	June	July	August	September
1	4.2	24	11	2.3	0.7	0.5
2	4.3	25	9.2	2.2	0.7	0.5
3	4.4	23	9.0	2.1	0.7	0.5
4	4.4	24	8.5	2.0	0.7	0.5
5	10	29	7.9	1.9	0.7	0.4
6	14	23	7.6	1.8	0.7	0.4
7	12	21	7.2	1.8	0.7	0.4
8	9.6	19	6.5	1.7	0.9	0.4
9	8.9	18	5.7	1.7	1.4	0.4
10	8.4	17	5.5	1.6	1.1	0.4
11	7.5	18	5.1	1.5	0.9	0.4
12	6.5	19	4.8	1.4	0.9	1.2
13	6.0	20	4.6	1.3	0.9	0.9
14	11	20	4.4	1.3	0.9	0.8
15	8.7	21	4.2	1.2	0.8	0.7
16	7.8	21	4.1	1.2	0.8	0.7
17	6.5	22	3.8	1.1	0.8	0.6
18	6.5	23	3.7	1.1	0.8	0.6
19	6.4	24	3.5	1.1	0.8	0.6
20	6.3	24	3.3	1.1	0.8	0.6
21	6.3	26	3.1	1.0	0.8	0.6
22	6.2	26	4.1	1.0	0.7	0.6
23	14	27	3.4	0.9	0.7	0.6
24	17	25	3.2	0.9	0.7	0.6
25	18	24	2.9	0.9	0.7	0.6
26	19	21	2.6	0.9	0.6	0.5
27	20	19	2.5	0.8	0.6	0.5
28	20	17	2.8	0.8	0.6	0.5
29	19	15	2.7	0.8	0.6	0.5
30	24	13	2.5	0.7	0.6	0.5
31		12		0.7	0.6	
Mean	10.6	21.3	5.0	1.3	0.8	0.6
Runoff in acre-feet	629	1,310	296	81	47	34

TABLE A-68

DAILY MEAN DISCHARGE
OF OWL CREEK

April through September 1963
(In second-feet)

Day	April	May	June	July	August	September
1	7.5	25	*67	19	4.7	2.0
2	7.5	26	*61	17	4.5	2.0
3	7.5	28	*54	17	4.3	1.9
4	7.5	28	*50	16	4.1	1.9
5	20	29	*48	16	4.0	1.9
6	40	30	*46	15	3.8	1.9
7	24	30	*42	14	3.7	1.8
8	19	28	*43	14	4.9	1.8
9	17	26	*44	13	5.6	1.8
10	15	*24	*43	13	4.5	1.8
11	13	*36	*41	13	4.0	1.8
12	13	*34	*43	12	3.7	4.6
13	15	*30	*48	12	3.5	3.5
14	18	27	*51	11	3.2	3.1
15	14	30	*51	10	3.0	2.8
16	12	39	*80	10	2.8	2.7
17	10	*48	55	10	2.7	2.6
18	10	*53	48	9.5	2.6	2.5
19	10	*59	47	9.0	2.6	2.5
20	10	*62	50	8.4	2.5	2.4
21	9.0	*72	49	7.5	2.5	2.4
22	8.0	*70	38	6.7	2.5	2.3
23	9.0	*70	31	6.4	2.4	2.3
24	10	*71	25	6.0	2.4	2.1
25	10	*73	23	5.9	2.4	1.9
26	10	*77	22	5.8	2.3	1.7
27	12	*73	21	5.8	2.2	1.5
28	13	*70	21	5.6	2.1	1.5
29	15	*73	20	5.3	2.1	1.5
30	19	*75	19	5.1	2.0	1.5
31		*70		4.9	2.0	
Mean	13.5	47.9	42.7	10.4	3.2	2.2
Runoff in acre-feet	803	2,950	2,540	642	198	131

* Allen-Arreche Ditch open -- diversions included

TABLE A-69

DAILY MEAN DISCHARGE
OF RADER CREEK

April through September 1963
(In second-feet)

Day	April	May	June	July	August	September
1		10	32	13	3.8	1.3
2		11	29	12	3.5	1.3
3		12	26	12	3.2	1.2
4		11	21	11	2.9	1.2
5		12	27	10	2.7	1.2
6		14	23	9.4	2.5	1.1
7		15	22	8.7	2.5	1.1
8		14	21	8.2	2.5	1.0
9		12	22	7.8	2.4	1.0
10		11	23	7.4	2.3	0.9
11		11	20	7.2	2.5	0.9
12		10	20	7.0	2.5	1.6
13		11	21	6.6	2.4	1.5
14		13	24	6.8	2.4	1.5
15		14	23	6.5	2.3	1.4
16	7.0	16	30	6.3	2.3	1.5
17	7.2	19	22	6.1	2.2	1.6
18	7.7	23	21	5.9	2.1	1.7
19	7.6	27	20	5.8	2.0	1.7
20	8.0	29	22	5.6	1.9	1.6
21	7.1	28	22	5.4	1.8	1.6
22	6.4	25	22	5.3	1.7	1.6
23	5.9	25	19	5.2	1.7	1.5
24	6.0	27	17	5.1	1.6	1.4
25	6.1	28	15	4.9	1.6	1.3
26	7.0	35	14	4.8	1.5	1.2
27	7.9	35	14	4.7	1.4	1.1
28	8.8	37	15	4.6	1.4	1.1
29	10	40	14	4.5	1.3	1.0
30	10	47	13	4.3	1.3	1.0
31		35		4.1	1.3	
Mean	7.5	21.2	21.1	7.0	2.2	1.3
Runoff in acre-feet	224	1,300	1,260	429	134	78

TABLE A-70

DAILY MEAN DISCHARGE OF EAGLE CREEK
AT EAGLEVILLE

March through September 1963
(In second-feet)

Day	March	April	May	June	July	August	September
1		3.6	10	41	15	5.5	2.9
2		4.5	11	34	16	5.3	2.9
3		3.8	14	34	16	4.9	2.8
4		4.7	13	29	17	4.8	2.7
5		14	17	34	17	4.8	2.6
6	4.5	14	16	26	18	4.8	2.7
7	4.5	9.5	17	23	18	4.7	2.8
8	4.5	6.9	15	26	15	4.6	2.7
9	4.4	6.2	15	28	13	5.4	2.6
10	4.5	5.9	13	27	14	5.0	2.8
11	4.4	5.3	12	23	13	4.6	2.7
12	5.6	5.0	11	23	11	4.2	2.6
13	5.4	5.3	9.8	30	11	4.0	2.7
14	4.1	7.0	11	43	11	4.0	2.5
15	5.0	5.0	14	47	10	3.8	2.5
16	4.9	6.5	17	49	9.4	3.5	2.5
17	5.1	4.8	21	42	8.9	3.5	2.5
18	4.0	4.5	25	38	8.4	3.3	2.5
19	4.2	4.9	42	36	8.0	3.3	2.6
20	4.4	5.0	51	42	8.4	3.3	2.6
21	4.2	5.6	49	39	8.2	3.3	2.8
22	4.2	4.9	42	34	7.7	3.1	2.8
23	4.2	4.6	42	26	7.6	3.1	2.5
24	3.9	4.5	47	21	7.1	3.1	2.5
25	4.3	4.1	55	19	7.0	3.1	2.3
26	4.0	4.3	46	19	6.9	3.0	2.3
27	4.0	4.4	43	19	6.4	2.9	2.3
28	3.8	6.2	47	19	6.3	2.8	2.2
29	3.8	8.7	49	18	6.1	2.8	2.2
30	3.8	10	50	15	5.9	2.8	2.2
31	3.8		48		5.5	2.8	
Mean	4.4	6.1	28.2	30.1	10.7	3.9	2.6
Runoff in acre-feet	225	365	1,730	1,790	660	238	153

TABLE A-71

DAILY MEAN DISCHARGE
OF EMERSON CREEK

April through September 1963
(In second-feet)

Day	April	May	June	July	August	September
1	5.5	17	23	8.1	3.9	2.8
2	5.5	20	20	8.0	3.8	2.8
3	6.0	22	20	7.8	3.6	2.8
4	6.0	21	19	7.7	3.5	2.8
5	11	18	22	7.5	3.3	2.8
6	12	14	21	7.3	3.2	2.8
7	8.5	14	18	7.0	3.1	2.8
8	7.9	15	15	6.8	3.7	2.7
9	7.8	16	15	6.7	4.4	2.7
10	7.5	15	15	6.6	4.1	2.7
11	6.5	15	14	6.4	3.7	2.7
12	6.0	15	14	6.2	3.4	4.0
13	6.0	15	13	6.0	3.3	3.8
14	6.5	17	12	6.1	3.3	3.7
15	7.0	19	11	6.0	3.2	3.5
16	7.5	23	50	5.9	3.2	3.5
17	7.5	24	20	5.7	3.1	3.4
18	7.3	25	14	5.5	3.1	3.3
19	7.2	28	12	5.3	3.1	3.3
20	7.0	27	11	5.2	3.1	3.2
21	6.7	35	11	5.1	3.1	3.2
22	6.5	32	10	5.0	3.1	3.1
23	6.3	32	10	4.9	3.1	3.1
24	6.3	31	10	4.7	3.0	3.1
25	6.5	32	10	4.6	3.0	2.9
26	6.5	29	9.8	4.5	3.0	2.8
27	8.0	27	9.5	4.5	3.0	2.7
28	11	25	9.1	4.4	2.9	2.7
29	15	25	8.7	4.3	2.9	2.7
30	16	26	8.4	4.2	2.8	2.7
31		25		4.0	2.8	
Mean	7.8	22.5	15.2	5.9	3.3	3.0
Runoff in acre-feet	466	1,390	903	361	202	181

TABLE A-72

DAILY MEAN DISCHARGE
OF SUSAN RIVER AT SUSANVILLE

March through September 1963
(In second-feet)

Day	March	April	May	June	July	August	September
1	75	105	357	147	131	5.0	2.7
2	73	93	446	139	128	5.0	2.3
3	69	91	565	108	149	5.0	2.8
4	63	97	545	100	149	5.0	4.5
5	63	154	510	94	145	5.0	5.0
6	65	959	402	75	144	5.0	5.9
7	63	1,080	406	64	139	4.5	6.1
8	60	886	410	56	137	4.5	6.1
9	58	666	410	53	139	4.8	10
10	54	580	430	69	131	5.9	8.4
11	52	506	402	83	125	5.4	7.2
12	51	434	369	81	117	4.8	13
13	47	354	295	77	115	32	17
14	50	414	219	75	114	50	12
15	51	390	191	72	118	50	9.2
16	51	357	183	70	123	52	9.2
17	51	333	181	69	118	53	9.7
18	46	345	183	68	114	53	12
19	50	339	207	71	114	51	15
20	52	312	263	57	110	52	14
21	51	282	270	48	110	51	12
22	48	295	255	49	110	51	11
23	52	298	280	58	105	52	9.7
24	54	300	263	55	100	52	9.0
25	55	300	228	49	5.0	52	7.7
26	55	280	205	144	5.0	48	8.2
27	112	263	175	156	5.0	16	7.0
28	179	273	163	137	5.0	5.2	5.9
29	139	290	147	137	5.0	3.4	6.7
30	125	318	133	136	5.0	2.4	7.2
31	123		144		5.0	2.6	
Mean	68.9	380	298	86.6	97.4	25.4	8.6
Runoff in acre-feet	4,240	22,600	18,320	5,150	5,990	1,560	509

TABLE A-73

DAILY MEAN DISCHARGE OF GOLD RUN CREEK
NEAR SUSANVILLE

March through September 1963
(In second-feet)

Day	March	April	May	June	July	August	September
1	7.0	9.3	42	20	6.2	1.5	1.0
2	7.5	8.3	51	18	5.9	1.5	0.9
3	6.7	8.4	56	16	5.9	1.4	0.8
4	7.5	8.2	59	14	5.4	1.3	0.8
5	7.2	8.7	74	15	5.4	1.3	0.9
6	7.0	135	68	14	5.1	1.3	1.0
7	6.6	142	74	12	5.0	1.2	0.9
8	6.4	69	59	12	4.7	1.3	1.1
9	6.1	45	42	11	4.5	1.4	1.1
10	6.1	33	32	11	3.6	1.3	0.9
11	5.5	25	28	11	3.3	1.3	0.8
12	4.9	20	26	10	3.0	1.2	1.9
13	5.5	19	25	9.6	2.9	1.1	1.6
14	5.0	37	28	9.4	2.7	1.1	1.4
15	5.2	35	32	9.2	2.5	1.1	1.3
16	5.2	29	43	9.2	2.5	1.1	1.5
17	5.0	24	49	9.6	2.4	1.0	1.6
18	5.3	20	52	9.4	2.5	1.0	1.6
19	5.2	18	57	9.0	2.4	1.0	2.4
20	5.3	17	55	8.3	2.2	1.0	1.6
21	5.3	15	52	7.9	2.1	1.0	1.4
22	4.9	16	46	7.7	2.1	1.0	1.3
23	4.7	16	41	8.1	2.0	1.0	1.3
24	5.0	17	38	8.3	1.9	1.0	1.3
25	5.2	17	36	7.5	2.0	1.0	1.3
26	5.2	16	33	7.2	1.9	1.0	1.2
27	15	15	30	6.9	1.8	1.0	1.2
28	38	17	26	6.7	1.8	1.0	1.2
29	29	23	25	6.4	1.6	0.9	1.2
30	17	31	22	6.4	1.6	0.9	1.2
31	10		21		1.5	1.0	
Mean	8.4	29.8	42.6	10.4	3.2	1.1	1.3
Runoff in acre-feet	515	1,770	2,620	616	195	70	75

TABLE A-74

DAILY MEAN DISCHARGE OF SUSAN RIVER
AT JOHNSTONVILLE BRIDGE

March through September 1963
(In second-feet)

Day	March	April	May	June	July	August	September
1					60	2.0	
2					60		
3					60		
4							
5							
6					N		
7					O		
8							
9							
10					R		
					E		
11					C		
12					O		
13					R		
14					D		
15							
16				80			
17				78	12		
18				80	12		
19				78	12		
20				78	12		
21				70	12		
22				70	12		
23				75	12		
24				76	12		
25				75	5.0		
26				75	5.0		
27				80	5.0		
28				65	5.0		
29				60	4.0		
30				60	4.0		
31					3.0		
Mean				73.3	17.1	2.0	
Runoff in acre-feet				2,180	609	4	

SEE SUSAN RIVER AT SUSANVILLE

WAY TOO HIGH ?

TABLE A-75

DAILY MEAN DISCHARGE OF WILLOW CREEK
NEAR SUSANVILLE

April through September 1963
(In second-feet)

Day	April	May	June	July	August	September
1	22	28	14	11	13	11
2	21	26	13	11	12	11
3	21	23	13	11	12	11
4	20	22	13	11	12	10
5	21	21	13	11	13	11
6	79	21	13	11	13	11
7	155	21	13	11	12	10
8	133	21	13	10	13	10
9	100	22	13	10	13	10
10	87	21	13	10	13	11
11	82	27	13	10	12	11
12	74	28	13	10	12	11
13	65	28	13	11	12	11
14	63	24	13	11	13	10
15	67	24	13	11	13	11
16	67	23	13	11	12	10
17	63	22	13	11	12	11
18	60	20	13	12	11	11
19	61	17	13	12	12	11
20	60	16	13	12	11	11
21	58	15	12	12	11	11
22	57	17	12	12	11	11
23	54	19	12	12	10	11
24	48	19	12	12	10	11
25	46	17	12	12	10	11
26	45	17	12	13	10	11
27	44	16	11	13	11	11
28	38	15	11	13	11	12
29	33	14	11	13	11	12
30	28	14	11	13	11	12
31		14		13	11	
Mean	59.1	20.4	12.6	11.5	11.7	10.9
Runoff in acre-feet	3,510	1,250	748	706	720	649

TABLE A-76

DAILY MEAN DISCHARGE OF WILLOW CREEK
NEAR LITCHFIELD

March through September 1963
(In second-feet)

Day	March	April	May	June	July	August	September
1	45	27	34	18	15	13	15
2	44	26	32	18	15	13	15
3	42	26	30	18	15	13	15
4	40	24	28	17	15	13	15
5	39	25	26	17	15	13	15
6	44	71	24	17	15	13	15
7	47	214	24	17	15	12	15
8	46	179	25	17	14	12	14
9	43	125	28	17	14	12	15
10	42	106	26	17	14	12	15
11	41	96	28	17	14	12	15
12	39	85	30	17	14	12	15
13	33	76	33	16	14	12	15
14	28	70	31	17	14	12	15
15	26	75	30	17	14	17	14
16	27	78	29	17	14	16	15
17	26	74	27	17	14	20	15
18	27	71	24	17	14	14	15
19	26	70	21	17	14	15	16
20	26	71	20	16	14	15	16
21	26	70	19	16	14	14	15
22	27	67	19	16	14	13	15
23	26	64	21	16	14	13	15
24	26	58	22	16	13	13	15
25	25	54	21	16	14	14	16
26	23	52	21	16	13	13	16
27	23	51	20	16	13	13	16
28	25	48	19	15	13	14	16
29	25	41	19	15	13	15	16
30	24	36	18	15	13	15	16
31	25		18		13	15	
Mean	32.5	71.0	24.7	16.6	14.0	13.6	15.2
Runoff in acre-feet	2,000	4,220	1,520	988	861	839	904

TABLE A-77

STORED WATER AVAILABLE FOR
REDIVERSION AT SUSANVILLE

April through September 1963
(In second-feet)

Day	April	May	June	July	August	September
1				102		
2				102		
3				125		
4				127		
5				124		
6				125		
7				122		
8				122		
9				125		
10				118		
11				113		
12				106		
13				105	*27	
14				105	46	
15				109	46	
16				115	48	
17				111	49	
18				107	49	
19				108	47	
20				104	48	
21				104	48	
22				104	47	
23				99	48	
24				**95	48	
25					48	
26			*98		44	
27			115		**12	
28			100			
29			104			
30			105			
31						
Mean			104	112	43.7	
Runoff in acre-feet			1,040	5,310	1,300	

* Reservoir opened
** Reservoir closed

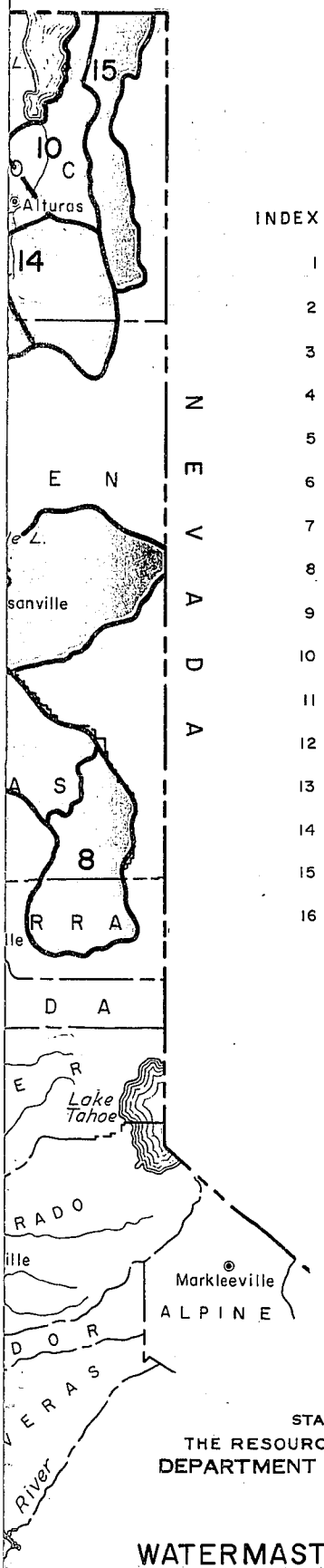
TABLE A-78

DAILY MEAN DISCHARGE OF JACOB-NEUHAUS DITCH
AT BARRON-MURRER PROPERTY LINE

March through September 1963
(In second-feet)

Day	March	April	May	June	July	August	September
1			2.5	2.6	2.2	2.3	2.1
2			2.2	2.6	2.6	2.2	2.0
3			2.1	2.6	2.2	2.2	2.0
4			1.9	2.6	2.6	1.9	2.3
5			1.6	2.4	2.4	2.4	2.3
6			0	2.2	2.2	2.3	2.0
7			0	2.2	2.0	2.3	2.0
8			0	2.3	0.7	2.7	
9			1.9	2.2	1.6	2.9	
10			2.2	1.9	2.6	2.9	
11			2.3	2.3	2.7	3.0	
12			2.3	2.3	2.6	2.7	
13			2.3	2.3	2.6	2.7	
14			2.7	1.9	2.8	2.9	
15			2.7	1.9	2.8	2.2	
16			2.6	1.9	2.6	2.3	
17			2.4	1.9	2.6	2.2	
18			2.6	2.5	2.7	2.2	
19			2.4	2.3	2.7	2.3	
20			2.3	2.4	2.6	1.9	
21			2.2	2.3	2.6	2.0	
22			1.9	2.0	2.6	2.2	
23			2.7	2.2	2.6	2.3	
24			4.6	2.3	2.3	2.3	
25			3.2	2.2	2.4	2.3	
26			2.3	2.3	2.3	2.5	
27			2.2	2.3	2.6	2.6	
28			2.3	2.3	2.4	2.3	
29		2.7	2.4	2.2	2.3	2.2	
30		2.6	1.9	2.2	2.3	1.9	
31			1.9		2.3	1.9	
Mean		2.6	2.1	2.3	2.4	2.4	2.1
Runoff in acre-feet		11	132	134	148	145	29

PLATE I



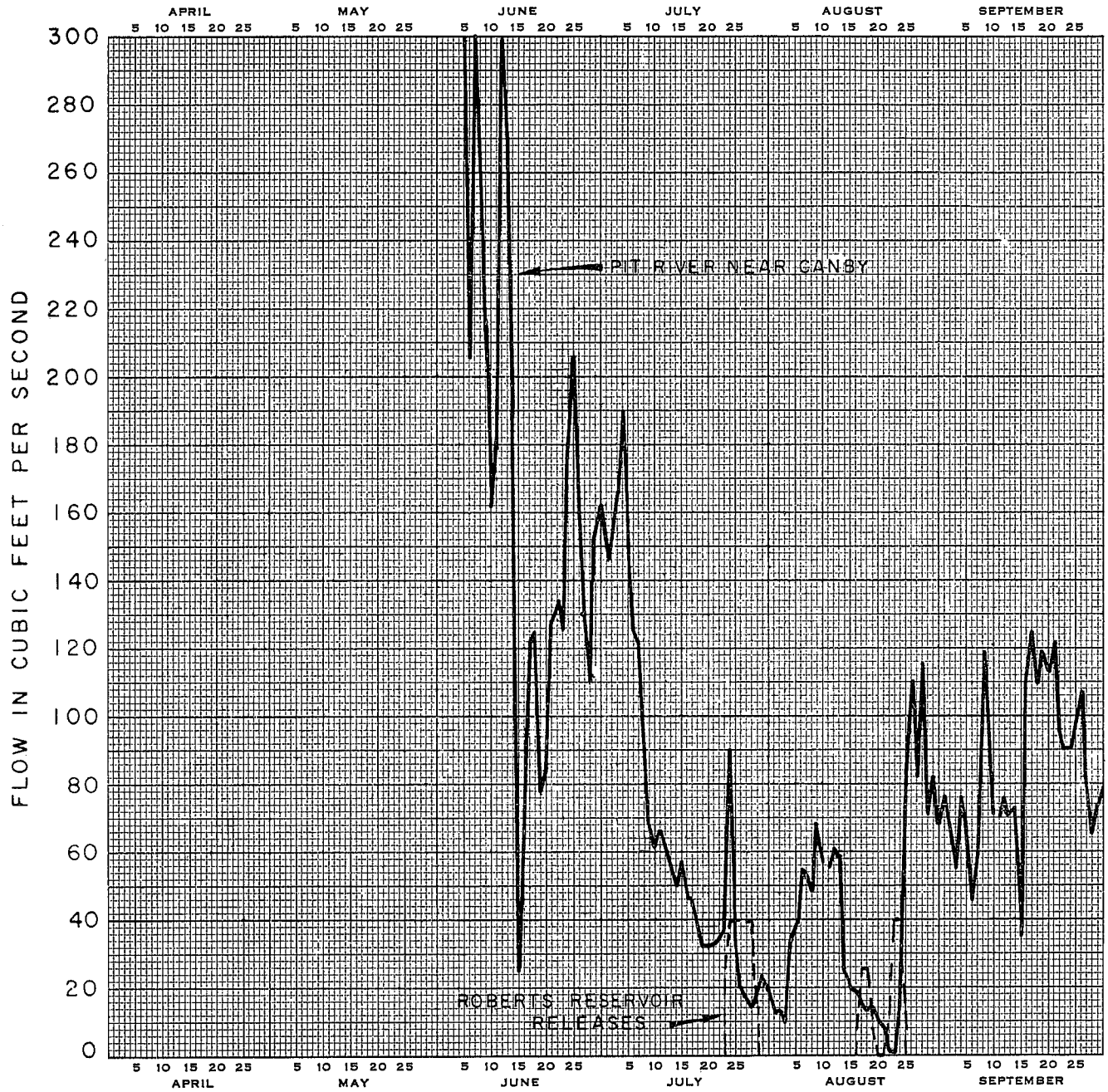
INDEX TO SERVICE AREAS

1 ASH CREEK
2 BIG VALLEY
3 BURNEY CREEK
4 BUTTE CREEK
5 COW CREEK
6 HAT CREEK
7 INDIAN CREEK
8 MIDDLE FORK FEATHER RIVER
9 NORTH FORK COTTONWOOD CREEK
10 NORTH FORK PIT RIVER
11 SEIAD CREEK
12 SHACKLEFORD CREEK
13 SHASTA RIVER
14 SOUTH FORK PIT RIVER
15 SURPRISE VALLEY
16 SUSAN RIVER

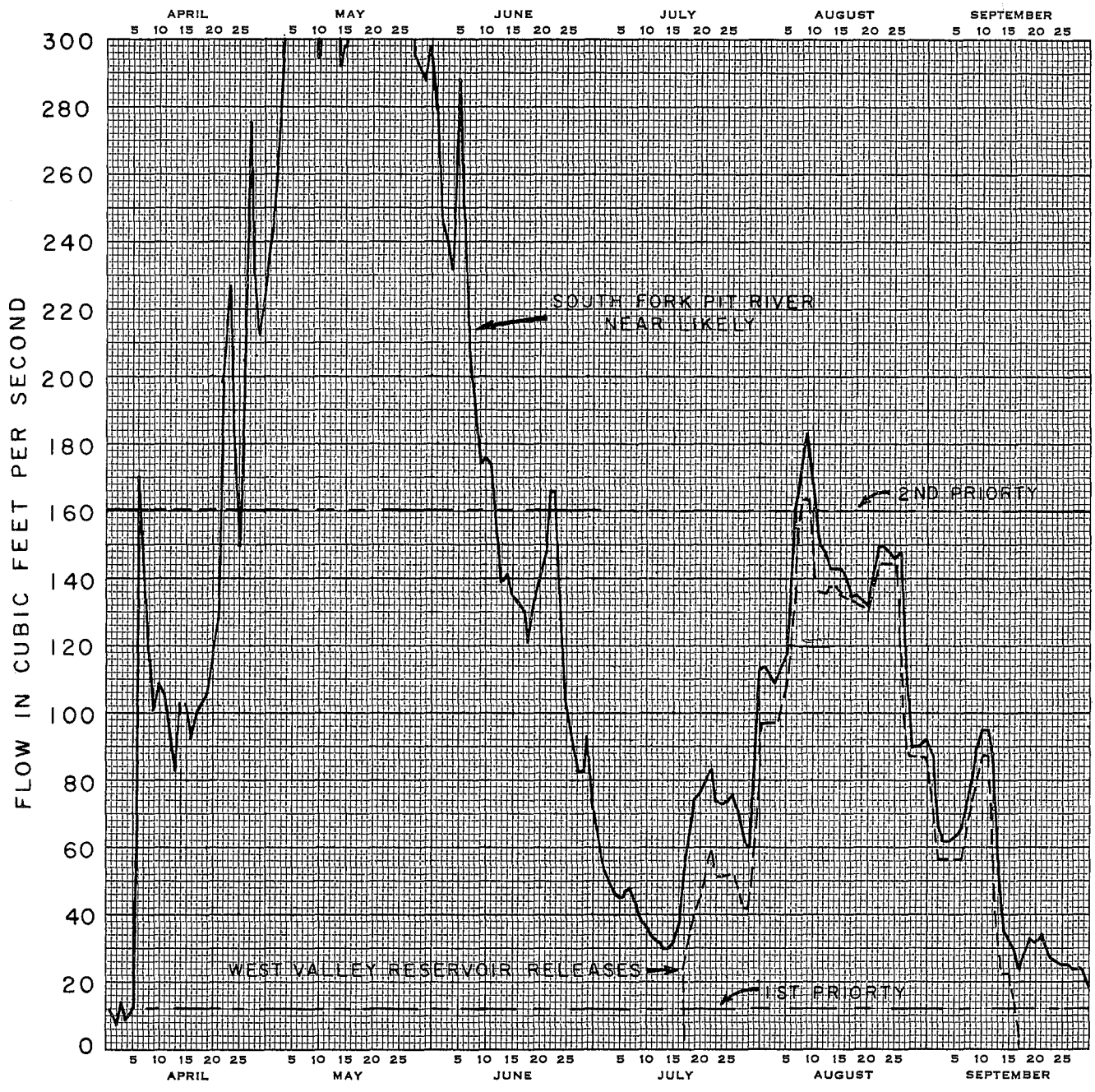
STATE OF CALIFORNIA
THE RESOURCES AGENCY OF CALIFORNIA
DEPARTMENT OF WATER RESOURCES

WATERMASTER SERVICE AREAS IN NORTHERN CALIFORNIA

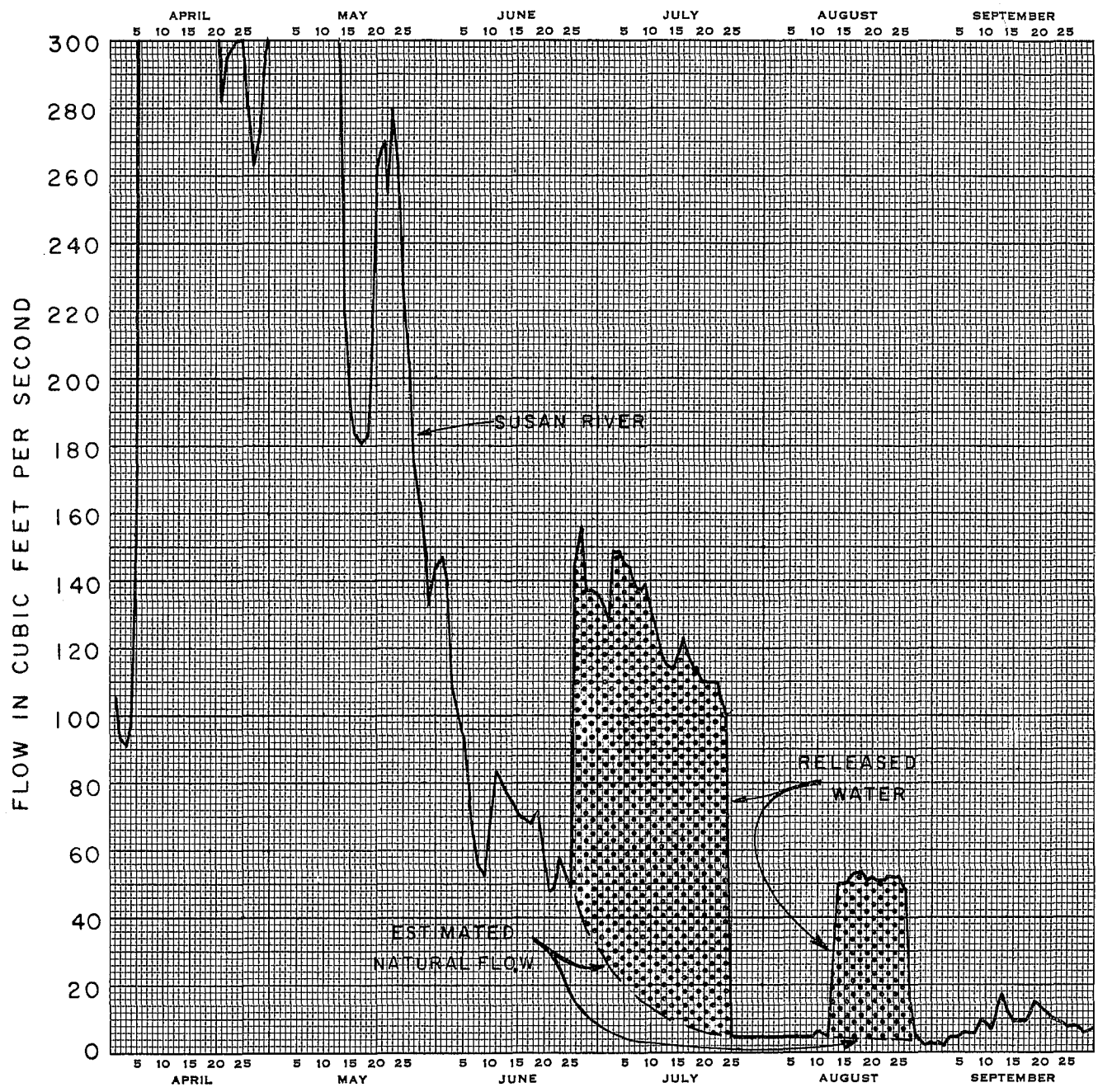
SCALE OF MILES
20 0 20 40



HYDROGRAPHS OF PIT RIVER NEAR CANBY
AND ROBERTS RESERVOIR RELEASES
1963 SEASON



HYDROGRAPHS OF SOUTH FORK PIT RIVER NEAR LIKELY
AND WEST VALLEY RESERVOIR RELEASES
1963 SEASON



HYDROGRAPHS OF SUSAN RIVER AT SUSANVILLE
AND STORED WATER AVAILABLE FOR REDIVERSION AT SUSANVILLE
1963 SEASON